From the school book

Exercise 4 On scientific notation of the rational number

1 In each of the following , tick (✓) in front of the numbers which are in the standard form:

(1) 5.3×10^7 ☐
(2) 0.2×10^{-4} ☐
(3) 0.025×10^8 ☐
(4) 20.5×10^5 ☐
(5) 7×10^{-4} ☐
(6) 10×10^{-10} ☐
(7) 4.25×10 ☐
(8) 33.9×10^6 ☐
(9) -5.782×10^2 ☐
(10) -0.0003×10^3 ☐

2 Write each of the following numbers in the standard form :

(1) 📖 600 000
(2) – 20 000
(3) 📖 7 millions
(4) 19 millions
(5) 46 870 000
(6) 58

3 Write each of the following numbers in the standard form :

(1) 📖 0.0006
(2) 📖 0.000053
(3) 📖 0.000864
(4) 0.421
(5) 25.0003
(6) – 300.501

4 The number of inhabitants in Egypt is about 83 000 000 persons.
Write this number in the standard form.

5 The area of the surface of the Earth is about 510 000 000 km^2.
Express this number by the standard form.

6 The mass of the Hydrogen atom is about 0.00000000000000000000000167 gm.
Write this number in the standard form.

7 The light velocity is about 300 000 km/s. Express this velocity by m/s. in the standard form.

8 Dr. Ahmed Zewail discovered the femto second which is a millionth of a miliardth of a second. Express it by the standard form.

9 At writting the number 2.74×10^{20} as a whole number, find the number of zeroes that are on the right of the digit 4

10 Write the following numbers in the standard form :

(1) 📖 68×10^5
(2) 📖 68×10^{-5}
(3) 📖 720×10^6
(4) 📖 750×10^{-9}
(5) -32.4×10^4
(6) -702.5×10^{-8}
(7) 📖 0.4×10^{-10}
(8) 0.0005×10^{15}
(9) 0.0036×10^{-4}
(10) 0.0020205×10^{12}

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11 Put the suitable sign (<) or (>) :

(1) 6.4×10^3 ☐ 4.6×10^3

(2) 6.2×10^4 ☐ 4.1×10^5

(3) 0.0041 ☐ 3.2×10^{-2}

(4) 4370 ☐ 3.41×10^4

(5) 2.10×10^{-5} ☐ 1.82×10^{-5}

(6) 9.1×10^{-4} ☐ 1.2×10^{-5}

(7) 6.920×10^5 ☐ 96230

(8) 3.69×10^{-4} ☐ 0.0000623

12 Arrange the following numbers in a descending order :

3.6×10^{-3} , 5.2×10^{-5} , 1×10^{-2} , 8.35×10^{-2} , 6.08×10^{-8}

13 Choose the correct answer from those given :

(1) $3.04 \times 10^7 =$ ....

(a) 340 000 (b) 304 000 (c) 3 400 000 (d) 30 400 000

(2) $2.37 \times 10^{-4} =$ ....

(a) 0.00237 (b) 0.000237 (c) 23700 (d) 0.0000237

(3) If 0.00079 = 7.9 a , then a = ...

(a) 10^{-1} (b) 10^{-3} (c) 10^{-4} (d) 10^4

(4) If $0.0000503 = m \times 10^{-5}$, then m = ...

(a) 503 (b) 5.03 (c) 50.3 (d) 0.503

(5) If the thickness of a sheet of paper is 0.012 cm. , then a ream of 400 sheets is of height ....

(a) 48×10^{-3} cm. (b) 48×10^{-2} cm. (c) 4.8×10^{0} cm. (d) 48 cm.

(6) Which of the following equals $\frac{1}{2}$ milliard ?

(a) 50×10^8 (b) 5×10^8 (c) 0.5×10^8 (d) 500×10^7

(7) Which of the following is the greatest ?

(a) 6.3×10^5 (b) 9.8×10^4 (c) 5.2×10^5 (d) 7.3×10^4

(8) Which of the following is the smallest ?

(a) 0.6×10^5 (b) 0.25×10^5 (c) 7×10^4 (d) 17.5×10^4

(9) $6\,000 \times 50 =$ ....

(a) 300×10^2 (b) 30×10^5 (c) 3×10^5 (d) 30×10^4

(10) $45 \times 900 =$ ....

(a) 4.05×10^2 (b) 4.05×10^3 (c) 4.05×10^4 (d) 45×10^2

(11) $0.7 \times 0.005 =$ ....

(a) 3.5×10^3 (b) 3.5×10^{-2} (c) 3.5×10^2 (d) 3.5×10^{-3}

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14 **Write the result of each of the following in the standard form :**

(1) $(6.4 \times 10^8) \times (1.5 \times 10^5)$

(2) $(8.2 \times 10^7) \times (2.1 \times 10^{-4})$

(3) $(5.02 \times 10^{-4}) \times (0.1 \times 10^{-3})$

(4) $(4.4 \times 10^3) \times (2 \times 10)^5$

(5) $(3.8 \times 10^8) \div (1.9 \times 10^6)$

(6) $(125.5 \times 10^{-3}) \div (5 \times 10^4)$

(7) $(8.8 \times 10^{25}) \div (8.8 \times 10^{22})$

(8) $(5 \times 10)^4 \div (2.5 \times 10^{-3})$

15 **Write the result of each of the following in the standard form :**

(1) $(3.8 \times 10^5) + (4.6 \times 10^4)$

(2) $(4.54 \times 10^4) + (3.76 \times 10^3)$

(3) $(5.3 \times 10^8) - (0.8 \times 10^7)$

(4) $(2.65 \times 10^{-2}) - (6.34 \times 10^{-3})$

16 **Write the result of each of the following in the standard form :**

(1) 5000×3000

(2) 400×0.00007

(3) $8000 \div 0.004$

(4) $0.000033 \div 500$

(5) $(20\,000)^3$

(6) $(0.002)^2$

(7) $(0.1)^{-8}$

17 **Find the value of n in each of the following :**

(1) $800\,000 = 8 \times 10^n$

(2) $0.00000006 = 6 \times 10^n$

(3) $0.00052 = 5.2 \times 10^n$

(4) $0.000357 = 3.57 \times 10^n$

(5) $(0.004)^2 = 1.6 \times 10^n$

(6) $76293 = n \times 10^4$

Life Applications

18 If the diameter of the Earth equals 1.27×10^4 km. long and the length of the diameter of Mars is 6.79×10^3 km. Which of the two planets is the greater and what is the difference between the two diameter lengths in the standard form ?

19 If light travels at a speed of 3×10^8 m/s. :

(a) Calculate the distance from the Sun to the Earth if you know that the light of the Sun takes 8 minutes to reach the Earth.

(b) If the distance between planet Venus and the Sun is 108 million kilometres , calculate the elapsed time (in minutes) that light takes to reach Venus from the Sun.

For excellent pupils

20 **Find the result of the following in the standard form :** $\dfrac{9.02 \times 10^3 + 4.98 \times 10^4}{2.5 \times 10^{-5}}$

21 **Without using the calculator ,**
write each of the following numbers in the standard form :

(1) $10^{29} - 10^{28}$

(2) $2^{19} \times 5^{15}$

22 If $x = 5 + (3 \times 10) + (4 \times 10^2) + (6 \times 10^3) + (9 \times 10^4) + (4 \times 10^5) + (2 \times 10^6)$

Write x in the standard form without using the calculator.

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From the school book

Exercise 5 On order of mathematical operations

1 Calculate the value of each of the following :

(1) $3 + 12 \div 6$
(2) $-5 + 2 \times 3$
(3) 📖 $2 \times 6 - 4 \div 2$
(4) 📖 $4 \times 7 - 3^2$
(5) 📖 $4 \times 2^3 - 20$
(6) 📖 $9 + 4 \times 3^2$
(7) 📖 $144 - 8 \div 2^3$

2 Calculate the value of each of the following :

(1) 📖 $196 \div (7 - 5)^2$
(2) $18 \div (9 - 6) \times (1 + 2)$
(3) $20 \div 5 + 8 - (4 - 1)$
(4) $10 \times 4 - (2 \times 6 - 8)$
(5) $(7 - 4) \times 2 \div (5 - 3)$
(6) $(30 - 6) \div 6 \times 30 \div 3$
(7) 📖 $7\ (6^2 \div 2 \times 3)$
(8) 📖 $12\ (2^2) \div 24 + 3^2$
(9) 📖 $9\ (4)^2 \div 2^2 \times 3$
(10) $9 \times 10 + 20 \div 2 - 3$
(11) $6 + 9 \div 3 + 2 \times 3^2 + 11 - 8$
(12) $6 - 5 + 72 \div 9 + 24 \div 2^3 + 4 \times 1 + 10 \times 1 + 5$

3 Calculate the value of each of the following :

(1) 📖 $2 - [(7 - 3) - 2]$
(2) 📖 $[4 - (5 - 2)] - 1$
(3) 📖 $3 + [5 + 2\ (8 \div 4)]$
(4) 📖 $2^3 + [4 + (2 - 1)]$
(5) $[(2 + 23 - 7) \times 2] \div 4$
(6) $10 \times 3 \div [4 - (9 - 8)]$
(7) $(26 + 1) \div [3\ (4 - 3)]$
(8) $(15 \times 2) \div [5 - (9 - 7)]$
(9) $2 + 3\ [4 + (6 \times 3 - 8)] \times 2$
(10) 📖 $2\ [(5^2 + 1) - (4^2 - 1)]$
(11) 📖 $5\ [(2^2 - 1) - (2^2 - 2)]$
(12) $6 \div 3 + [7 + 20 \div (6 - 2^2)]$

4 Calculate the value of each of the following :

(1) $[-6 \div (-3)] \times [-30 \div (-3)]$
(2) $(-10 + 3) \div (-8 + 7)$
(3) $7 - [10 - (-8)] - 3$
(4) $[(11 - (-10)] \times 2 \div (-6)$
(5) $2 \div (-1) - (-4)^2$
(6) $-6 - [-2 - 5]^2$

5 Calculate the value of each of the following :

(1) 📖 $\frac{15 + 7}{15 - 4}$
(2) 📖 $\frac{8 + 20 - 4}{8 - 4}$
(3) $\frac{-4 \times (-10)}{-9 + 7}$
(4) $\frac{1 + 15}{8 - (2 - 2)}$
(5) $\frac{11 - (5 - 4)}{1 + 4}$
(6) $(3 - 1)^3 + \frac{7 \times 3}{-1 - 6} - \frac{2 \times 15}{6}$
(7) $\frac{5^2 - 5 \times 2}{(15 + 3) \div 6}$
(8) 📖 $\frac{5 + 2 \times 5}{2^2 + 1} + 5^2 - 5$
(9) $\frac{3^2 \times 6 \div 3}{2 \times 1 + (3 + 1)^2}$

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6 **Calculate the value of each of the following :**

(1) $\left(\frac{3}{2} \times 3\frac{1}{2}\right) \div \left(\frac{6}{5} - 1\right)$

(2) 📖 $15 \div \frac{1}{3} - \frac{3}{4} \times 10^3 + 27$

(3) $16 + 4 \div 2 - 3 \times 10^{-2}$

(4) $9 \div \frac{1}{2} \times 2 - 3 \div \frac{1}{5}$

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7 📖 **If $x = 3$, what is the numerical value of the expression :** $2\left(\frac{5x+3}{4x-3}\right)$ « 4 »

---

8 📖 **Evaluate the expressions when t = 2 and s = 5 :**

(1) $(t + s)^2$

(2) $(s - t)^3$

(3) $\left(\frac{s}{t}\right)^3$

(4) $\frac{6^2}{s - 1}$

(5) $\frac{s - t}{s^3}$

(6) $\frac{12}{4 s^2}$

---

9 📖 **Evaluate :** $16\,t \div (4\,s) + 3\,st$ **, for t = 9 and s = 6** « 168 »

---

10 If $x = 4\,(5 + 6) - 6$ and $y = 9\,(36 \div 12) \div 3$,
find the value of the expression : $2x + 4y$ « 112 »

---

11 If $x = 3\,(5 + 7) - 4$ and $y = 4\,(8 + 2) \div 5$,
find the numerical value of the expression : $x - 4y$ « zero »

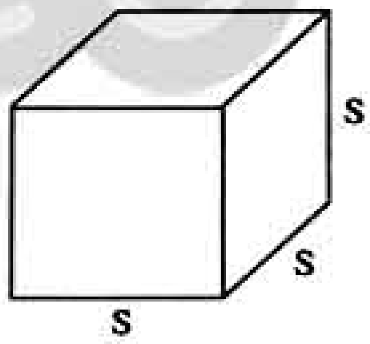
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12 If $x = 18 - 4 \times 2 \div 2 + 1$ and $y = 8 + 9 \times 3 - 4^2 + 11$,
find the numerical value of the expression : $\left(\frac{y}{x}\right)^{-3}$ « $\frac{1}{8}$ »

Geometric Applications

13 📖 **In the opposite figure :**

The total area of a cube is $T = 6\,s^2$, find T when :



(1) s = 3 m.

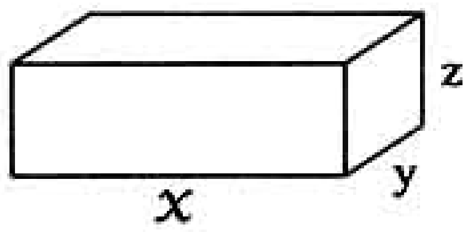
(2) s = 0.8 cm.

« 54 m.^{2} , 3.84 cm.^{2} »

---

14 **In the opposite figure :**

The total area of a cuboid is $T = 2\,(xy + yz + zx)$ find T when :



(1) $x = 2$ cm. , $y = 3$ cm. and $z = 5$ cm.

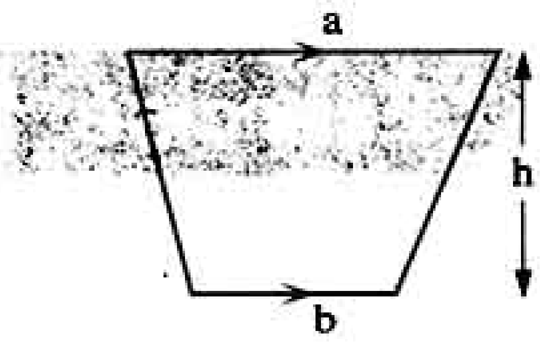
(2) $x = \frac{3}{5}$ m. , $y = 0.4$ m. and $z = \frac{1}{5}$ m.

« 62 cm.^{2} , $\frac{22}{25}$ m.^{2} »

Rania SaYed

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15 **In the opposite figure :**



The area of a trapezium

is $A = \frac{1}{2} h (a + b)$, find A when :

(1) h = 2 metres , $a = \frac{3}{4}$ metre and $b = \frac{1}{4}$ metre.

(2) h = 4 metres , $a = \frac{1}{2}$ metre and $b = \frac{1}{2}$ metre.

« 1 $m.^2$, 2 $m.^2$ »

For excellent pupils

16 **Rewrite each of the following mathematical statements after putting the parentheses in the places which make them true :**

(1) 3 + 96 ÷ 12 × 4 = 5

(2) 3 + 96 ÷ 12 × 4 = 35

(3) 3 + 96 ÷ 12 × 4 = 33

ذاكرولى RaNia SaYed

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From the school book

Exercise 6 On the square root of a perfect square rational number

1 Find each of the following :

(1) $\sqrt{16}$ (2) $-\sqrt{25}$ (3) $\pm\sqrt{2500}$ (4) $\pm\sqrt{40000}$

(5) $\sqrt{\frac{9}{49}}$ (6) $-\sqrt{\frac{64}{25}}$ (7) $\sqrt{0.81}$ (8) $\pm\sqrt{1.44}$

(9) $\sqrt{6\frac{1}{4}}$ (10) $-\sqrt{1\frac{11}{25}}$ (11) $-\sqrt{4^2}$ (12) $\pm\sqrt{8^2}$

(13) $\sqrt{\left(\frac{81}{100}\right)^2}$ (14) $\sqrt{\left(-\frac{3}{4}\right)^2}$ (15) $\pm\sqrt{\frac{576}{1225}}$ (16) $-\sqrt{\frac{2.5}{40}}$

(17) $-\sqrt{\frac{49\,a^4}{25\,b^6}}$ (18) $\pm\sqrt{\frac{16\,b^8}{121\,h^2}}$ (19) $\sqrt{\frac{49\,a^4\,b^2}{9}}$ (20) $\sqrt{\frac{25\,x^2\,y^2}{36}}$

2 Find the two square roots of each of the following numbers :

(1) 64 (2) 144 (3) $\frac{9}{25}$

(4) $6\frac{1}{4}$ (5) 0.25 (6) 0.0049

3 Find each of the following :

(1) $\sqrt{9}+\sqrt{16}$ (2) $\sqrt{36+64}$ (3) $\sqrt{25-9}$

(4) $-\sqrt{225-81}$ (5) $\sqrt{3^2+4^2}$ (6) $-\sqrt{(10)^2-8^2}$

(7) $\sqrt{\frac{9}{16}+1}$ (8) $-\sqrt{\frac{1}{4}\left(1-\frac{3}{4}\right)}$ (9) $\sqrt{\frac{5^4\times5^3}{5^5}}$

(10) $\sqrt{\left(\frac{1}{2}\right)^2\div\left(\frac{1}{5}\right)^2}$ (11) $\sqrt{\left(\frac{1}{2}\right)^4\times\left(\frac{1}{3}\right)^4}$ (12) $\sqrt{\left(\frac{1}{4}\right)^2\times\left(\frac{1}{4}\right)^3}$

4 Complete the following :

(1) $\frac{3}{4}\times\sqrt{\frac{16}{9}}=$ ....

(2) $\sqrt{\frac{81}{49}}\times\frac{14}{27}=$ ....

(3) $\sqrt{\frac{9}{4}}-\frac{3}{2}+\left(\frac{3}{2}\right)^{zero}=$ ....

(4) $\sqrt{36}+\sqrt{16}=\sqrt{\text{..........}}$

(5) $\sqrt{(81)^2-81\times2+1}=$ ....

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(6) The multiplicative inverse of $\sqrt{\frac{4}{25}}$ in the simplest form equals ....

(7) The multiplicative inverse of $\sqrt{0.49}$ in the simplest form equals ....

(8) 📖 The multiplicative inverse of the rational number $\sqrt{\frac{10}{2.5}}$ equals ....

(9) The additive inverse of the number $-\sqrt{\frac{9}{16}}$ in the simplest form equals ....

(10) The rational number $6\frac{1}{4}$ in the form $\left(\frac{a}{b}\right)^2$ is ....

(11) $\sqrt{\frac{25}{64}} = \sqrt{\left(\frac{\cdots\cdots}{\cdots\cdots}\right)^2} = \cdots\cdots$

(12) $\sqrt{(-3)^2} = \cdots\cdots$

(13) $\sqrt{a^4b^8} = \cdots\cdots$

(14) If $a = \sqrt{\frac{1}{4}}$ and $b = 2$, then $ab = \cdots\cdots$

(15) If $a = -\frac{1}{2}$ and $b = -\frac{9}{8}$, then $\sqrt{ab} = \cdots\cdots$

(16) If $2x = \sqrt{36}$, then $x = \cdots\cdots$

(17) If $a = 0.000625$, then $\sqrt{a} = 2.5 \times 10^{\cdots\cdots}$

(18) $\sqrt{(2009)^2 + 2(2009) \times 213 + (213)^2} = \cdots\cdots$

5 Choose the correct answer from those given :

(1) $\sqrt{1\frac{9}{16}} = \cdots\cdots$

(a) $1\frac{3}{4}$ (b) $-1\frac{3}{4}$ (c) $1\frac{1}{4}$ (d) $-1\frac{1}{4}$

(2) 📖 $\sqrt{10^2 - 6^2} = \cdots\cdots$

(a) 4 (b) 8 (c) ± 4 (d) ± 8

(3) $\sqrt{18 \times 10 \times 10 \times 18} = \cdots\cdots$

(a) 18 (b) 180 (c) 10 (d) 100

(4) $\sqrt{\sqrt{81}} = \cdots\cdots$

(a) 81 (b) 27 (c) 9 (d) 3

(5) $\sqrt{2^2 + \sqrt{25}} = \cdots\cdots$

(a) 3 (b) −3 (c) 9 (d) −9

(6) If : $\frac{x}{2} = \frac{8}{x}$, then $x = \cdots\cdots$

(a) 4 (b) −4 (c) ± 4 (d) 16

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(7) If : $x = \sqrt{\frac{1}{4}}$, then $x^3 =$ ....

(a) $\frac{3}{8}$ (b) $\frac{1}{8}$ (c) $\frac{1}{16}$ (d) $\frac{1}{64}$

(8) $\sqrt{(a+b)^3 (a+b)} =$ ....

(a) $(a+b)^2$ (b) $a^4 + b^4$ (c) $-(a+b)^2$ (d) $\pm (a+b)^2$

(9) $\sqrt{1} + \sqrt{4} + \sqrt{9} + \sqrt{16} + \sqrt{25} + \sqrt{36} + \sqrt{49} + \sqrt{64} =$ ....

(a) 6 (b) $\sqrt{204}$ (c) $\sqrt{81}$ (d) 6^2

(10) The side length of the square whose area is $16 x^2$ cm.^{2} = ... cm.

(a) $8x$ (b) $4x$ (c) $2x$ (d) $8x^2$

6 **Simplify each of the following to the simplest form :**

(1) $(-\frac{1}{2})^3 \times \sqrt{\frac{64}{9}}$

(2) $\sqrt{\frac{49}{4}} \times (\frac{2}{7})^{zero} \times (-\frac{2}{7})^2$

(3) $\frac{2}{5} \times \sqrt{\frac{9}{16}} \div (-\frac{1}{2})^3$

(4) $(-\frac{1}{3})^2 + \sqrt{\frac{64}{81}} - (\frac{3}{4})^{zero}$

(5) $\frac{3}{4} \times (-\frac{2}{3})^3 \times \left(\frac{3}{\sqrt{4}}\right)^2$

(6) $\sqrt{(\frac{25}{4})^2 \times (\frac{2}{5})^2}$

7 **Simplify each of the following to the simplest form :**

(1) $\sqrt{16} + \sqrt{25}$

(2) $\sqrt{\sqrt{16} + \sqrt{25}}$

(3) $\sqrt{(\sqrt{16} + \sqrt{25})^2}$

8 **Find two rational numbers lying between :** $\sqrt{\frac{4}{9}}$ and $\frac{3}{4}$

9 **Which is greater :** $\frac{3}{5}$ or $\sqrt{\frac{4}{9}}$? Find the difference between them.

10 **Which is smaller :** $\sqrt{2\frac{1}{4}}$ or $(-\frac{2}{3})^2$? Find their difference.

11 **Find each of the following :**

(1) $\sqrt{5^2 - 2 \times 5 + 1}$

(2) $\sqrt{(\frac{1}{4})^2 - 2 \times \frac{1}{4} + 1}$

(3) $\sqrt{20 \div 5 + 8 - (4-1)}$

(4) $\sqrt{8 \times (5+11) \div (2+6)}$

(5) $\sqrt{2 \times 8 + 10 - 3 + 12 + 11 \times 6 + 88 \div 2^3 + 99 \div 11}$

(6) $\sqrt{6 + 3\sqrt{100} - \sqrt{121}}$

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Geometric Applications

12 (1) $\overline{XY}$ is a line segment where $(XY)^2 = 25$ cm.^{2} , E is the midpoint of $\overline{XY}$

Find the length of : $\overline{XE}$ « 2.5 cm. »

(2) If : $(AB)^2 = 144$ cm.^{2} , $(BC)^2 = 625$ cm.^{2} and $B \in \overline{AC}$

Find the length of : $\overline{AC}$ « 37 cm. »

(3) The area of a square is 0.49 cm.^{2} Find its perimeter. « 2.8 cm. »

(4) The area of a square is equal to the area of a triangle with base = 9 cm. long and its height = 8 cm. find the side length of the square. « 6 cm. »

(5) The area of a circle 154 cm.^{2} Calculate its radius length $(\pi = \frac{22}{7})$ « 7 cm. »

(6) The area of a circle 78.5 cm.^{2} Calculate its diameter length $(\pi = 3.14)$ « 10 cm. »

(7) The area of a circle 616 cm.^{2} Calculate its circumference $(\pi = \frac{22}{7})$ « 88 cm. »

(8) If three quarters of the area of a square is $1\frac{11}{64}$ m.^{2}

Calculate the side length of the square. « $1\frac{1}{4}$ m. »

(9) The length of a rectangle is twice its width and its area is 24.5 cm.^{2}

Calculate each of its width and length. « 3.5 cm. , 7 cm. »

For excellent pupils

13 If $\frac{m}{n}$ is a rational number and $\frac{m^2}{n^2} = 0.16$, find the value of $(\frac{m}{n})^3$ « ± 0.064 »

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Unit 1

📖 From the school book

Exercise 7 On solving equations of the first degree in one unknown in $\mathbb{Q}$

1 Find the solution set of each of the following equations :

(1) $x - 7 = 3$ where $x \in \mathbb{N}$
(2) 📖 $x + 17 = 13$ where $x \in \mathbb{N}$
(3) $5x = 20$ where $x \in \mathbb{Q}$
(4) $\frac{2}{5}x = \frac{1}{5}$ where $x \in \mathbb{Q}$
(5) 📖 $-4 + y = 13$ where $y \in \mathbb{N}$
(6) 📖 $m - (-3) = 1$ where $m \in \mathbb{Z}$
(7) $x - 7 = 0$ where $x \in \mathbb{Z}$
(8) $y - (-5) = -3$ where $y \in \mathbb{Q}$
(9) 📖 $x - 6\frac{1}{4} = 12\frac{1}{2}$ where $x \in \mathbb{Q}$
(10) 📖 $8.91 + x = 11.09$ where $x \in \mathbb{Q}$

2 Solve each of the following equations :

(1) $2x - 1 = 5$ where $x \in \mathbb{Q}$
(2) 📖 $8x + 4 = 12$ where $x \in \mathbb{Q}$
(3) 📖 $3x - 13 = 26$ where $x \in \mathbb{N}$
(4) $2x + 14 = 14$ where $x \in \mathbb{N}$
(5) 📖 $8 + 2x = 14$ where $x \in \mathbb{Z}$
(6) 📖 $\frac{5}{6}x - 4 = 11$ where $x \in \mathbb{Q}$
(7) $8 - 2x = -2$ where $x \in \mathbb{Z}$
(8) $2 - 5x = 0$ where $x \in \mathbb{Q}$
(9) $2x + 3x + 25 = 5$ where $x \in \mathbb{Z}$
(10) $6x - 2x + 7 = 4$ where $x \in \mathbb{Z}$

3 Solve each of the following equations in $\mathbb{Q}$:

(1) $2(x - 3) = 4$
(2) $3x + 2(5x - 3) = 7$
(3) $7(x - 2) - 3(x + 1) = 3$
(4) 📖 $3(x + 2) + 7(x - 1) = 12$
(5) 📖 $4(x - 1) - (x + 3) = 0$
(6) $5(x - 2) + 2(x + 4) = -16$
(7) $2(x - 3) + 3(x - 2) - 4x = -3$
(8) 📖 $3y + 6(y + 3) - (8y - 16) = 60$

4 Find in $\mathbb{Q}$ the solution set of each of the following equations :

(1) $2x + 5 = x + 9$
(2) 📖 $5x - 4 = 2x + 11$
(3) 📖 $x + 3 = 18 - 3x$
(4) $3x + 6 = 30 - 5x$
(5) $4(x + 1) = 2(x - 1)$
(6) $3(x - 2) = 5x - 10$
(7) 📖 $a + 5a - 2 = 2(3 - a)$
(8) 📖 $3(2x - 8) - (2x + 2) = x - 3$
(9) $\frac{x + 1}{3} = \frac{x - 1}{4}$
(10) $\frac{5}{4 + 4x} = \frac{3}{1 - 2x}$

5 Complete the following :

(1) If $x + 5 = 7$, then $x =$ ....
(2) 📖 If $3t = 6$, then the value of $6t =$ ....
(3) If $2x = 5$, then the value of $4x =$ ....
(4) 📖 If $x + 9 = 11$, then the value of $7x =$ ....

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(5) If $2t + 3 = 15$, then the value of $\frac{1}{3}t =$ ....

(6) If $Z - 1\frac{1}{4} = 5\frac{1}{2}$, then the value of $4Z - 18 =$ ....

(7) If $\frac{P}{4} = \frac{2}{3}$, then the value of $\frac{P}{2} =$ ....

(8) If the age of a man now is X years , then his age 5 years ago is ....

(9) If the age of a man now is y years , then his age after 4 years is ....

(10) If the age of a man after 5 years is X years, then his age now is ....

(11) If the age of Youssef after 4 years is X years, then his age 2 years ago is ....

(12) A rectangle with length equals triple its width. if the length = X cm.
, then its width = ... cm.

(13) The rectangle whose width = X cm. and its length is twice its width , then its perimeter = ... cm.

(14) Two integers, their sum is 5, if one of them is X, then the other one is ....

(15) Two integers, the difference between them is 2, if the small one is X, then the great one is ....

---

6 Choose the correct answer from those given :

(1) If $2X = 2$, then $3X - 1 =$ ....
(a) 2 (b) 3 (c) 4 (d) 5

(2) If $2X = 0$, then $X =$ ....
(a) 2 (b) 3 (c) 5 (d) zero

(3) If $2ab = 10$, then $3ab =$ ....
(a) 5 (b) 6 (c) 15 (d) 30

(4) If $0.2 + a = 5$, then $\frac{a}{4} =$ ....
(a) 4.8 (b) 1.3 (c) 1.2 (d) 19.2

(5) If $5X + 8X + 2X + 4X = 114$, then $5X + 3 =$ ....
(a) 33 (b) 35 (c) 47 (d) $8X$

(6) The S.S. of the equation $\frac{2a}{3} = 8 + 4a$ in $\mathbb{Q}$ is ....
(a) $\{-2.4\}$ (b) $\{2.4\}$ (c) $\{-3\frac{1}{3}\}$ (d) $\{0\}$

(7) Which of the following equations is equivalent to the equation $X + 3 = 12$?
(a) $X - 3 = -12$ (b) $X + (-3) = 12$
(c) $X - (-3) = 12$ (d) $X - (-3) = -12$

(8) Which of the following equations is equivalent to the equation $X - 12 = 15$?
(a) $X + 12 = -15$ (b) $\frac{1}{3}X - 4 = 5$ (c) $X - 4 = -5$ (d) $X + 4 = 5$

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Unit 1

Geometric Applications

7 **Find the measure of each angle in each of the following triangles :**

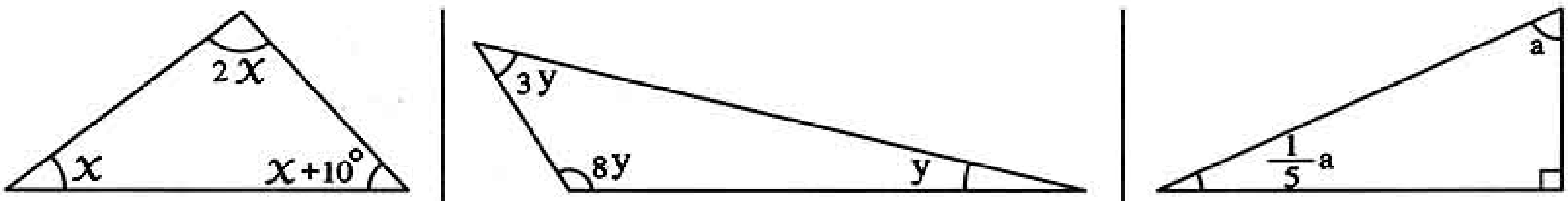
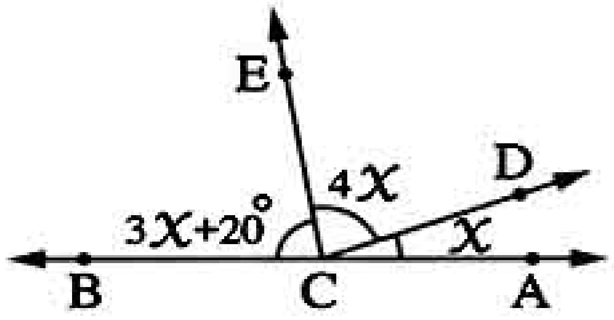


Fig. (1) Fig. (2) Fig. (3)

8 **In the opposite figure :**

If C ∈ $\overleftrightarrow{AB}$, find m (∠ DCE)



« 80° »

9 The length of a rectangle exceeds its width by 4 metres and its perimeter is 68 metres. Find the dimensions of the rectangle. « 19 m. , 15 m.»

10 The length of a rectangle decreases than the twice of its width by 4 cm., if its perimeter equals the perimeter of a square of side length 7 cm.
Find the dimensions of the rectangle. « 6 cm. , 8 cm. »

11 The length of a rectangle is twice its width. If the length decreases 5 cm. and the width increases 6 cm. , then the rectangle becomes a square.
Find the area of the rectangle. « 242 cm^2 »

Life Applications

12 Two integers , the smaller number is $2x$ and the greater number is $7x$, if the difference between them is 25 , find the two integers. « 10 , 35 »

13 Two natural numbers, one of them is twice the other and their sum is 108
Find the two numbers. « 36 , 72 »

14 The difference between two natural numbers is 5 and their sum is 21
What are the two numbers ? « 13 , 8 »

15 Find the number that if it is added to its triple the result is 32 « 8 »

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16 Find the number which if we subtract 9 from its triple , the result will be 6 « 5 »

17 Three consecutive natural numbers whose sum is 213
What are these numbers ? « 70 , 71 , 72 »

18 Find three consecutive odd numbers if their sum is 357 « 117 , 119 , 121 »

19 A man's age now is three times his son's age and after two years , the sum of their ages will be 52 years. What is the age of each now ? « 12 years , 36 years »

20 Three brothers , Amgad , Bassim and Ayman , the sum of their ages is 89 years. If Amgad was born before Bassim by 2 years and Bassim was born before Ayman by 6 years , what is the age of each of them now ? « 25 years , 31 years , 33 years »

For excellent pupils

21 **Find in $\mathbb{Q}$ the S.S. of each of the following equations :**

(1) $5 - \frac{6}{x} = -1$ (2) $-\frac{3}{5} + \frac{x}{10} = -\frac{1}{5} - \frac{x}{5}$

22 **Find in $\mathbb{Q}$ the S.S. of each of the following equations :**

(1) $(x + 3)^2 - (x - 2)^2 = 15$ (2) $(2x + 3)(2x - 1) - (2x - 1)^2 = 14$

23 If the S.S. of the equation $12x + 3 = 39$ in $\mathbb{Q}$ equals the S.S. of the equation $ax - 12 = a$ in $\mathbb{Q}$, find the value of a « 6 »

24 If a + 1 is a solution of the equation $(x + a)(x - a) = x^2 - ax + 3$ in $\mathbb{Q}$, find the value of a « 3 »

25 Three brothers were born in 1980 , 1984 and 1986 , the required is finding the year in which the sum of their ages became 41 years. « 1997 »

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From the school book

Exercise 8 On solving inequalities in $\mathbb{Q}$

1 Which number would you add to each side of the inequality to obtain x in one side of it ?

(1) $x + 5 > 9$ (2) $x - 4 < 6$ (3) $x - 7 < 3$ (4) $x + 9 > 12$

(5) $x - 1.5 \le 3.2$ (6) $4.8 \le x + 0.6$ (7) $1\frac{1}{2} > x - 2\frac{1}{2}$ (8) $x + \frac{1}{3} > -\frac{1}{6}$

2 Find the solution set of the inequality $x + 3 \le 6$, where :

(1) $x \in \mathbb{Z}$ (2) $x \in \mathbb{N}$

then represent the solution set on the number line.

3 Find the solution set of the following inequalities in $\mathbb{Q}$:

(1) $x + 2 > 5$ (2) $x + 4 > 1$ (3) $y - 5 > 7$

(4) $19 < y + 14$ (5) $-1 \ge x - 3$ (6) $-5\frac{1}{2} > a + 1\frac{1}{4}$

(7) $-2x < 12$ (8) $\frac{2}{3}x \ge 1$ (9) $-\frac{1}{4}x \le \frac{1}{4}$

4 Solve each of the following inequalities in $\mathbb{Q}$:

(1) $3x - 2 < 1$ (2) $2x + 3 < 9$ (3) $4x + 2 \ge -10$

(4) $3x - 2 \ge 5$ (5) $3x - 9 < 0$ (6) $1 + 2x \le -3$

(7) $9 - 6x < 15$ (8) $2 - 3x \le 4$ (9) $\frac{3x - 2}{5} \ge \frac{1}{2}$

(10) $8x - 3x + 1 \le 29$ (11) $4n - 2(n - 1) \ge 0$ (12) $-3m + 6(m - 4) > 9$

5 Solve each of the following inequalities in $\mathbb{Q}$:

(1) $6d + 1 \le 5d - 3$ (2) $6x + 2 \ge 14 + 5x$

(3) $3x - 2 < 5x - 8$ (4) $8 - 2x \le 5x$

(5) $5x + 1 \ge 2(x + 2)$ (6) $3(x + 2) < -x + 4$

(7) $3(x + 2) \ge -2(x + 1)$ (8) $2 - 3(x - 5) \ge x + 7$

(9) $3(7y - \frac{1}{3}) \le 20y - 1$ (10) $\frac{x}{2} + 3 \le 2x + 1$

(11) $4 - 5(x - 2) \le -2(-9 + 2x)$ (12) $3(y + 2) + 8 < 10 - (2 - y)$

(13) $1 - (4d - 1) > 2(d - 3)$ (14) $x - 3(2x + 1) < 5(1 + x) + 2$

6 Find the S.S. of each of the following inequalities :

(1) $9 \le 4x + 1 \le 17$, $x \in \mathbb{Z}$ (2) $9 \le 3x + 2 < 12$, $x \in \mathbb{Q}$

(3) $9 > x + 6 > 2$, $x \in \mathbb{N}$

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7 Complete :

(1) If $x > y$, then $x + z$ ...... $y + z$

(2) If $x < y$, then $x + z$ ...... $y + z$

(3) If $x < y$ and $y < z$, then $x <$ ......

(4) If $z > y$ and $y > x$, then $z >$ ......

(5) If $a - 3 < 0$, then ...... > ......

(6) If $a + 5 > 0$, then ...... > ......

(7) If $b < 0$, then $b + 3$ 3

(8) If $x > y$ and z is positive $(z > 0)$, then $x z$ ...... $y z$

(9) If $x < y$ and z is negative $(z < 0)$, then $x z$ ...... $y z$

8 Choose the correct answer from those given :

(1) If : $-x < 5$, then ....

(a) $x > 5$ (b) $x > -5$ (c) $x < 5$ (d) $x < -5$

(2) If $x \in \mathbb{N}$, then the S.S. of the inequality $-x > 3$ is ....

(a) $\{4 , 5 , \cdots\}$ (b) $\{-4 , -5 , \cdots\}$ (c) $\{-3\}$ (d) $\varnothing$

(3) $\frac{x}{3} < 4$ is equal to ....

(a) $x > \frac{4}{3}$ (b) $x < \frac{4}{3}$ (c) $x > 12$ (d) $x < 12$

(4) If $x \in \mathbb{Z}$, then the S.S. of the inequality $20 < 5x < 25$ is ....

(a) $\{4\}$ (b) $\{5\}$ (c) $\{4 , 5\}$ (d) $\varnothing$

(5) The S.S. of the inequality $-2x <$ zero in $\mathbb{Q}$ is ....

(a) $\varnothing$ (b) $\mathbb{Q}_+$ (c) $\mathbb{Q}_-$ (d) $\mathbb{Z}_+$

(6) The number of solutions of the inequality $\frac{1}{5} < x < \frac{2}{3}$, where $x \in \mathbb{Q}$ is ....

(a) zero (b) 1 (c) 2 (d) an infinite number.

(7) If $x > y$, then $\frac{1}{x}$ .... $\frac{1}{y}$, where $x \neq 0$, $y \neq 0$

(a) > (b) < (c) = (d) ≥

(8) The number 2 belongs to the S.S. of the inequality .... where x is an integer.

(a) $x > 2$ (b) $x < 2$ (c) $-x > -3$ (d) $-x > 3$

(9) If $x > 5$, then $-x$ ....

(a) < -9 (b) ≥ -5 (c) < -5 (d) > -5

9 Show by using examples that if $a > b$ and $c > d$, then it is not always correct that $a - c > b - d$

10 Put (✓) for the correct statement and (✗) for the incorrect statement, when a statement is false, give an example that shows why it is false (given that $x > y$) :

(1) $y < x$ ( )	(2) $x > 0$ ( )	(3) $y^2 \geq 0$ ( )	(4) $y^2 > y$ ( )
(5) $xy > 0$ ( )	(6) $x + y > y$ ( )	(7) $y^2 > x$ ( )	(8) $y^2 < xy$ ( )
(9) $xy < x^2$ ( )	(10) $x^3 < y^2$ ( )		

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Life Application



11 Hany wants to buy a pair of shoes and some shirts , if Hany has L.E. 200 , the price of the pair of shoes is L.E. 70 and the price of one shirt is L.E. 40

What is the greatest number of shirts can Hany buy ? « 3 »

For excellent pupils

12 If the S.S. of the inequality $a \leq 3x - 5 \leq b$ in $\mathbb{Q}$ is $\{x : x \in \mathbb{Q} , 2 \leq x \leq 5\}$, find the values of a and b « 1 , 10 »

---

13 **If : $-4 \leq x \leq 5$ and $2 \leq y \leq 7$, where $x \in \mathbb{Q}$ and $y \in \mathbb{Q}$, find :**

(1) The greatest possible value of the expression $x + y$ « 12 »

(2) The greatest possible value of the expression $y - x$ « 11 »

(3) The smallest possible value of the expression $x y$ « – 28 »

(4) The smallest possible value of the expression $x^2 + y^2$ « 0 »

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Worksheet 4 till lesson 4 unit 1

Answer the following questions :

1 Choose the correct answer from those given :

(1) The additive inverse of the number 3^{-1} is ....

(a) $\frac{1}{3}$ (b) $-\frac{1}{3}$ (c) 3 (d) -3

(2) $(2\,a)^3 =$ ....

(a) $2\,a^3$ (b) $8\,a$ (c) $8\,a^3$ (d) $32\,a$

(3) Which of the following $= \frac{1}{4}$ million ?

(a) 25×10^5 (b) 0.25×10^5 (c) 0.25×10^6 (d) 0.25×10^7

(4) $\left(\frac{2}{5}\right)^{-1} \div \frac{5}{2} =$ ....

(a) 1 (b) $\frac{5}{2}$ (c) $\frac{25}{4}$ (d) $\frac{4}{25}$

(5) $2.37 \times 10^{-4} =$ ....

(a) 0.00237 (b) 0.000237 (c) 23700 (d) 0.0000237

(6) $3\,y^{-1} =$ .... , $y \neq 0$

(a) $\frac{1}{3}\,y$ (b) $\frac{3}{y}$ (c) y^{-3} (d) y^3

2 Write each of the following numbers on its standard form (scientific form) :

(1) -2540000 (2) 0.000046

(3) 0.7×10^{-7} (4) 0.0435×10^9

3 [a] If $a = -\frac{1}{2}$, $b = 2$, $c = \frac{3}{2}$, find the numerical value of the expression : $a^2\,b^3 + (a + c)^5$

[b] Calculate the value of each of the following :

(1) $\frac{(3^{-2})^4}{3^{-5} \times 3^{-2}}$ (2) $(3^{zero} \times 2^{-2})^{-2}$ (3) $\frac{(-3)^7 \times (-3)^{-2}}{(-3)^5}$

4 Write the result of each of the following on the standard form :

(1) $(5.8 \times 10^7) + (3.2 \times 10^5)$ (2) $(65.5 \times 10^{-2}) \div (5 \times 10^2)$

(3) 60000×5000

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The answer of worksheet 4

Total mark 15

1 **Shade the circle that represents your choice for the correct answer :**

(1) (a) (b) (c) (d)

(2) (a) (b) (c) (d)

(3) (a) (b) (c) (d)

(4) (a) (b) (c) (d)

(5) (a) (b) (c) (d)

(6) (a) (b) (c) (d)

3

2 (1) ....

(2) ....

(3) ....

(4) ....

4

3 [a] ....

....

....

5

[b] (1) ....

(2) ....

(3) ....

4 (1) ....

(2) ....

(3) ....

3

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Worksheet 5 till lesson 5 unit 1

Answer the following questions :

1 Choose the correct answer from those given :

(1) If $0.000237 = 2.37 \times 10^{n}$, then n = ...

(a) 4 (b) 2 (c) – 4 (d) – 2

(2) $(x^{-2})^{3}$ = ... , $x \neq 0$

(a) x^{-6} (b) x^{-5} (c) x (d) x^{6}

(3) $-11 + 3 \times 7$ = ...

(a) 11 (b) 10 (c) – 56 (d) – 1

(4) $3^2 + 3^2 + 3^2$ = ...

(a) 3^3 (b) 3^8 (c) 1^2 (d) 3^6

(5) The number $1\frac{9}{16}$ = (..........)^2

(a) $1\frac{3}{4}$ (b) $\frac{4}{5}$ (c) $\frac{3}{4}$ (d) $\frac{5}{4}$

(6) Twice the number 2^{18} = ...

(a) 2^9 (b) 2^{36} (c) 2^{10} (d) 2^{19}

2 Calculate the value of each of the following :

(1) $8 \times 2^2 - 7 \times (4 + 1)$

(2) $2\left((5^2 + 1) - (4^2 - 1)\right)$

(3) $\frac{5 + 2 \times 5}{2^2 + 1} + 5^2 - 5$

(4) $16 \div \frac{1}{4} - \frac{3}{4} \times 10^2 + 25$

3 [a] Find the result in the standard form : $(4.4 \times 10^3) \times (2 \times 10^5)$

[b] Find the value of : $\frac{7^{-2} \times 7^5}{7^3}$

4 [a] If $x = -\frac{1}{2}$, $y = \frac{3}{4}$ **, find the numerical value of :** $x^3 y^2$

[b] If $x = 5$ **, find the value of the expression :** $2\left(\frac{3x + 6}{4x - 13}\right)$

ذاكرولى Rania Sayed

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The answer of worksheet 5

Total mark 15

1 **Shade the circle that represents your choice for the correct answer :**

(1) ⓐ ⓑ ⓒ ⓓ

(2) ⓐ ⓑ ⓒ ⓓ

(3) ⓐ ⓑ ⓒ ⓓ

(4) ⓐ ⓑ ⓒ ⓓ

(5) ⓐ ⓑ ⓒ ⓓ

(6) ⓐ ⓑ ⓒ ⓓ

3

2 (1) ....

(2) ....

(3) ....

(4) ....

4

3 [a] ....

....

[b] ....

....

4

4 [a] ....

....

[b] ....

....

4

RaNia SaYed
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Worksheet 6 till lesson 6 unit 1

Answer the following questions :

1 Choose the correct answer from those given :

(1) $\sqrt{(-7)^2} = \dots\dots$

(a) 49 (b) 7 (c) -7 (d) ± 7

(2) $\sqrt{10^2 - 8^2} = \dots\dots$

(a) 2 (b) 6 (c) ± 2 (d) ± 6

(3) $4 + 2 \times 3 = \dots\dots$

(a) 18 (b) 10 (c) 14 (d) 24

(4) The multiplicative inverse of the number 3^{-2} is $\dots\dots$

(a) $\frac{1}{3}$ (b) 9 (c) $\frac{1}{9}$ (d) 3

(5) If the thickness of a piece of paper = 0.012 cm. , then which of the following is the height of a ream of 600 pieces of paper ?

(a) (72×10^{-3}) cm. (b) (72×10^{-2}) cm.

(c) 72 cm. (d) (7.2×10^{zero}) cm.

(6) $\sqrt{\sqrt{16}} = \dots\dots$

(a) 16 (b) 8 (c) 4 (d) 2

2 Complete the following :

(1) $\frac{5^{-2} \times 5^{3}}{5^{4}} = 5^{\dots}$

(2) $-\sqrt{9+16} = -3 + \dots\dots$

(3) $(4\frac{1}{2})^3 \div (2\frac{1}{4})^3 = \dots\dots$

(4) A square is of side length $\frac{2x}{3}$ length unit , then its area is $\dots\dots$ square unit.

(5) If $x = \frac{1}{2}$, $y = \frac{1}{4}$, then $(x - y)^{-1} = \dots\dots$

(6) $2^5 \times \dots\dots = 2^{10}$

3 [a] A circle whose area is 154 cm^2. Find the length of its radius

[b] Reduce to the simplest form : $(-\frac{1}{2})^3 \times \sqrt{\frac{25}{9}} \times \sqrt{(\frac{8}{5})^2} \times 3^{-1}$

4 [a] If $a = \frac{1}{3}$, $b = -\frac{2}{3}$, **find the value of :** $|(a^3 \div b^3)^{-1}|$

[b] Calculate the value of : $5\left((2^2 - 1) - (2^2 - 2)\right)$

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The answer of worksheet 6

Total mark 15

1 **Shade the circle that represents your choice for the correct answer :**

(1) (a) (b) (c) (d)

(2) (a) (b) (c) (d)

(3) (a) (b) (c) (d)

(4) (a) (b) (c) (d)

(5) (a) (b) (c) (d)

(6) (a) (b) (c) (d)

3

2 (1) ....

(2) ....

(3) ....

(4) ....

(5) ....

(6) ....

3

3 [a] ....

....

[b] ....

....

4

3 [a] ....

....

[b] ....

....

5

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Worksheet 7 till lesson 7 unit 1

Answer the following questions :

1 Choose the correct answer from those given :

(1) $\sqrt{10^2 - 6^2} = \dots\dots$

(a) 4 (b) 8 (c) ± 4 (d) ± 8

(2) The number 0.0000014 = ……….

(a) 1.4×10^{-5} (b) 1.4×10^{5} (c) 1.4×10^{-6} (d) 1.4×10^{6}

(3) $\frac{9}{x^{-2}} \times \frac{x^{-4}}{3} = \dots\dots$

(a) $3x^{-6}$ (b) $\frac{3}{x^2}$ (c) $\frac{3}{x^6}$ (d) $\frac{3}{x^8}$

(4) The S.S. of the equation : $2x = -6$ in $\mathbb{Z}$ is ……….

(a) $\{-3\}$ (b) $\varnothing$ (c) $\{-6\}$ (d) $\{0\}$

(5) $(a^3)^4 = \dots\dots$

(a) a^{43} (b) a^7 (c) a^{-1} (d) a^{12}

(6) If : 3 y = 6 , then 6 y = ……….

(a) 2 (b) 3 (c) 6 (d) 12

2 Complete the following :

(1) $\sqrt{36} + \sqrt{16} = \sqrt{\dots\dots}$

(2) If the middle number of three consecutive natural numbers is x , then the sum of these three numbers in the simplest form = ……….

(3) $(2b^{-1})^{-1} = \dots\dots$

(4) $2 \times 6 - 4 \div 2$

3 [a] Two natural numbers , the difference between them is 5 and their sum is 15 find the two numbers.

[b] Reduce to the simplest form : $\sqrt{\frac{49x^2y^2}{25}}$

4 **[a] Find the S.S. of the following equation in $\mathbb{Q}$:** $3(2x - 1) = 15$

[b] Find the value of : $\left(-\frac{1}{3}\right)^2 + \sqrt{\frac{64}{81}} - \left(\frac{3}{7}\right)^{zero}$

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The answer of worksheet 7

Total mark 15

1 Shade the circle that represents your choice for the correct answer :

(1) (a) (b) (c) (d)

(2) (a) (b) (c) (d)

(3) (a) (b) (c) (d)

(4) (a) (b) (c) (d)

(5) (a) (b) (c) (d)

(6) (a) (b) (c) (d)

3

2 (1) ....

(2) ....

(3) ....

(4) ....

2

3 [a] ....

....

[b] ....

....

5

4 [a] ....

....

[b] ....

....

5

ذاكرولى
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RaNia SaYed

The answer of worksheet 8

Total mark 15

1 Shade the circle that represents your choice for the correct answer :

(1) (a) (b) (c) (d)

(2) (a) (b) (c) (d)

(3) (a) (b) (c) (d)

(4) (a) (b) (c) (d)

(5) (a) (b) (c) (d)

(6) (a) (b) (c) (d)

3

2 (1) .... (2) ....

(3) .... (4) ....

2

3 [a] ....

....

[b] ....

....

5

4 [a] ....

....

[b] ....

....

5

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From the school book

Exercise 5 On the triangle

1 Complete the following :

(1) The sum of measures of the inteior angles of a triangle = ……… °

(2) The measure of the exterior angle of a triangle is equal to the sum of ………

(3) If the measure of an angle in a triangle equals the sum of measures of the other two angles in the triangle , then the triangle is ………

(4) If the measure of an angle in a triangle is greater than the sum of measures of the other two angles , then the triangle is ………

(5) In Δ ABC : If m ($\angle$ A) + m ($\angle$ C) = m ($\angle$ B) , then m ($\angle$ B) = ……… °

(6) In Δ ABC : If m ($\angle$ B) > m ($\angle$ A) + m ($\angle$ C) , then $\angle$ B is ………

(7) It is possible to find a triangle each of its interior angles is of measure ……… °

2 Choose the correct answer from the given ones :

(1) The triangle contains two ……… angles at least.

(a) acute (b) obtuse (c) right (d) reflex

(2) The sum of measures of the interior angles of a triangle equals the measure of ……… angle.

(a) a right (b) a straight (c) an acute (d) a reflex

(3) In Δ XYZ, if : m ($\angle$ X) = 50° , m ($\angle$ Y) = 100°, then : m ($\angle$ Z) = ………

(a) 30° (b) 50° (c) 80° (d) 100°

(4) In Δ ABC, if : m ($\angle$ A) + m ($\angle$ B) = 110°, then : m ($\angle$ C) = ………

(a) 110° (b) 90° (c) 70° (d) 55°

(5) If the measures of two angles in a triangle are 35° and 45°, then the triangle is ………

(a) acute-angled (b) right-angled (c) obtuse-angled (d) equilateral

(6) The measure of the exterior angle of the equilateral triangle at any one of its vertices equals ………

(a) 60° (b) 120° (c) 150° (d) 30°

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3 **In each of the following figures , find the measure of the angle marked by (?) :**

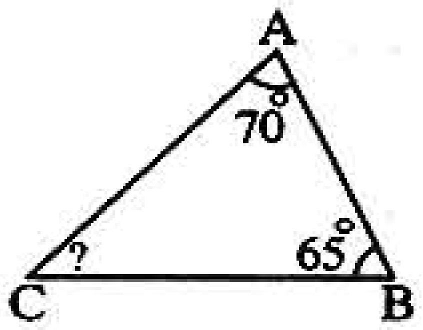


fig. (1)

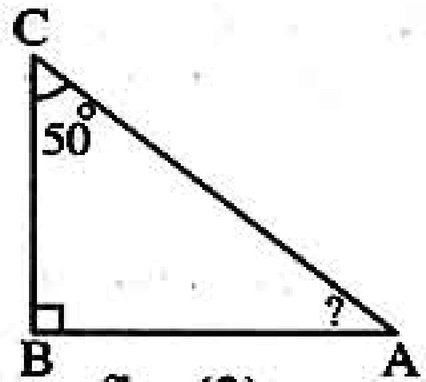


fig. (2)

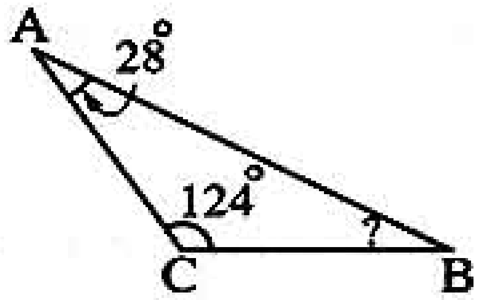


fig. (3)

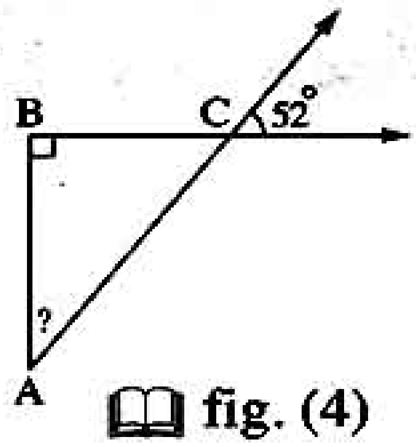


fig. (4)

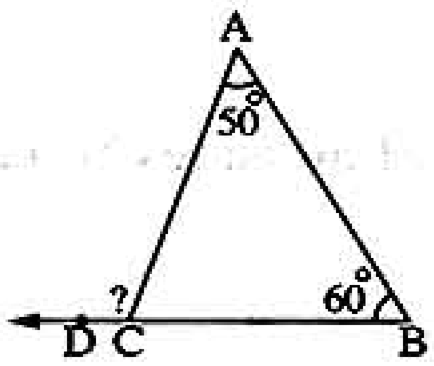


fig. (5)

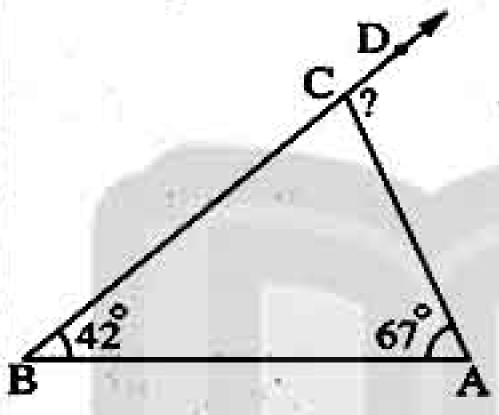


fig. (6)

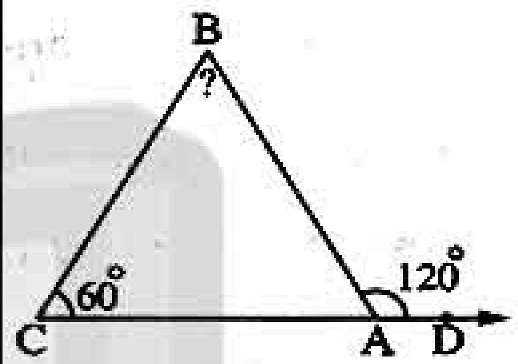


fig. (7)

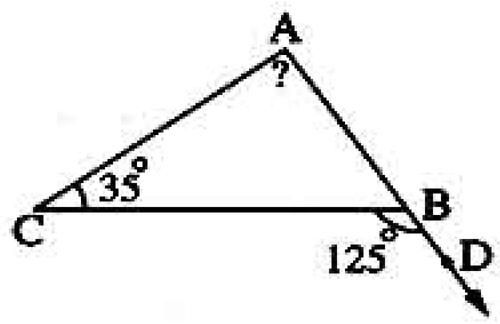


fig. (8)

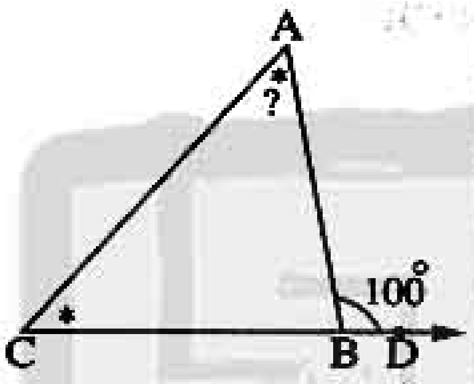


fig. (9)

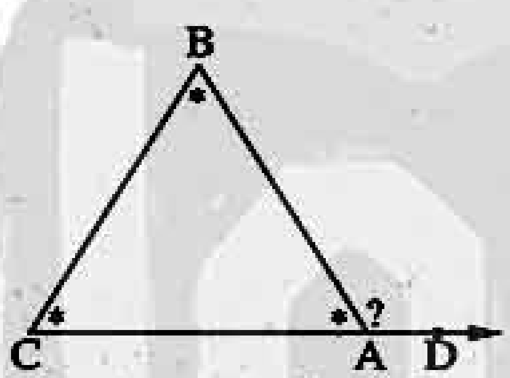


fig. (10)

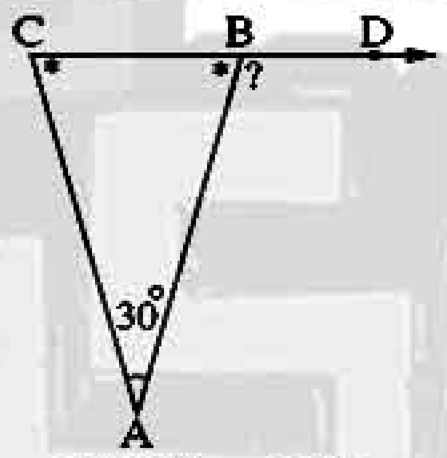


fig. (11)

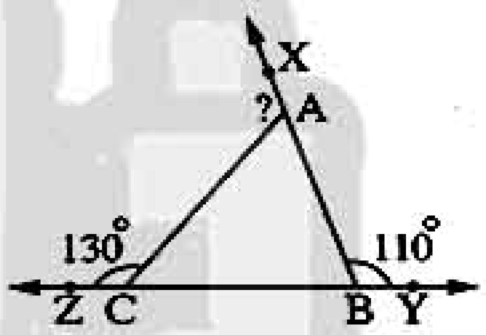


fig. (12)

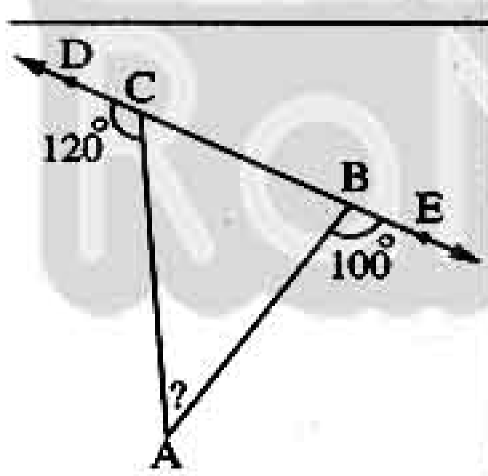


fig. (13)

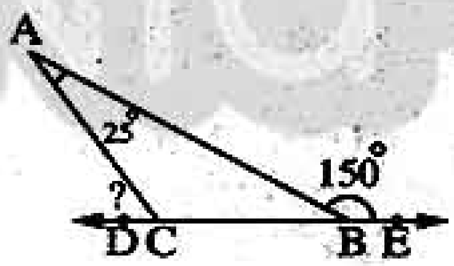


fig. (14)

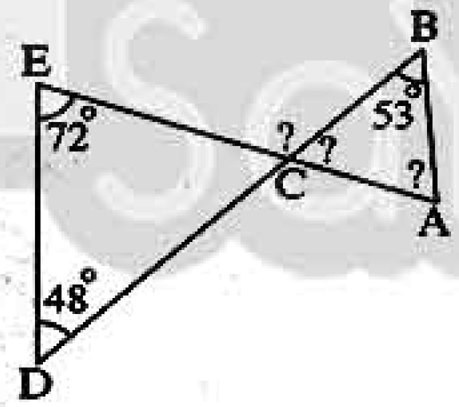


fig. (15)

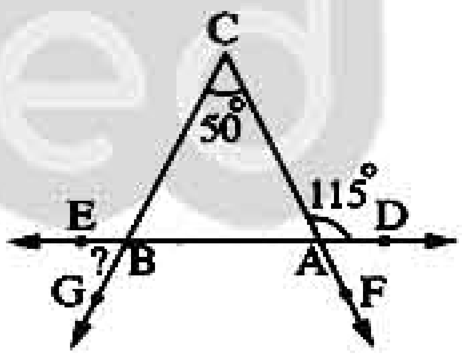


fig. (16)

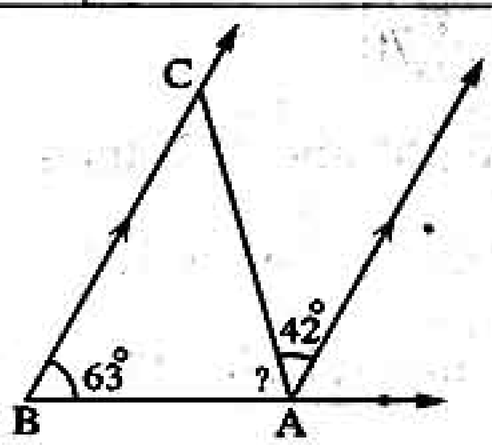


fig. (17)

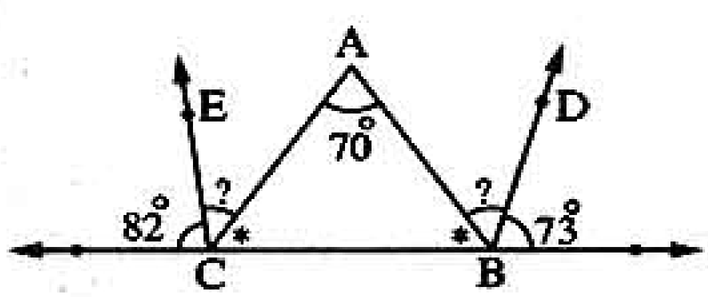
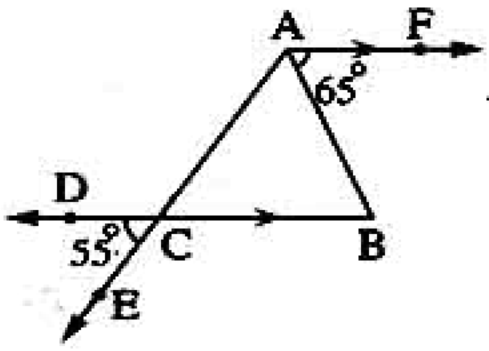


fig. (18)

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4 **In the opposite figure :**



$\overrightarrow{BD} \cap \overrightarrow{AE} = \{C\}$, $\overrightarrow{AF} \,//\, \overrightarrow{BC}$, m (∠ BAF) = 65°

, m (∠ DCE) = 55°

Complete the following proof to find :

the measures of the interior angles of Δ ABC

Given ……………………………………………

R.T.F. ……………………………………………

Proof ∵ $\overrightarrow{BD} \cap \overrightarrow{AE} = \{C\}$ (given)

∴ m (∠ ACB) = m (∠ ………) = ………° (………)

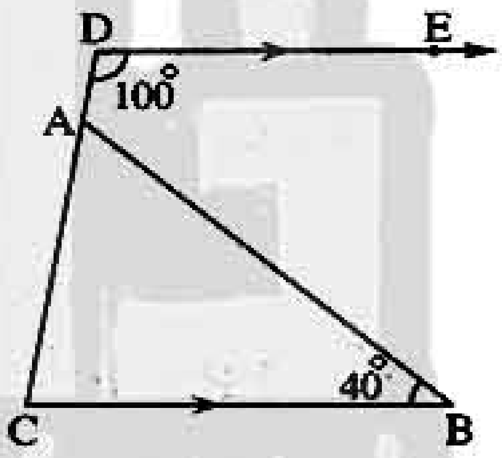
, ∵ $\overrightarrow{AF} \,//\, \overrightarrow{BC}$, $\overleftrightarrow{AB}$ is a transversal to them

∴ m (∠ FAB) = m (∠ ………) = ………° (……… angles)

, ∵ The sum of measures of the interior anlges of the triangle = ………°

∴ m (∠ BAC) = ………° – (………° + ………°) = ………° (The req.)

5 **In the opposite figure :**



A ∈ $\overline{DC}$, $\overrightarrow{DE} \,//\, \overline{CB}$, m (∠ D) = 100° and

m (∠ B) = 40°

Complete the following proof to find : m (∠ BAD)

Given ……………………………………………

R.T.F. ……………………………………………

Proof ∵ $\overrightarrow{DE}$ // $\overline{………}$, $\overleftrightarrow{………}$ is a transversal.

∴ m (∠ D) + m (∠ C) = ………°

(Two interior angles in the same side of the transversal)

∵ m (∠ D) = ………°

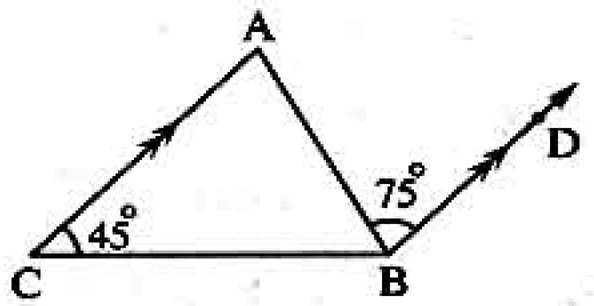
∴ m (∠ C) = ……… – ……… = ………°

∵ ∠ BAD is an exterior angle of Δ ………

∴ m (∠ BAD) = m (∠ ………) + m (∠ ………)

= ………° + ………° = ………° (The req.)

6 **In the opposite figure :**



$\overrightarrow{BD} \,//\, \overline{CA}$, m (∠ C) = 45° and

m (∠ ABD) = 75°

Find : m (∠ ABC)

« 60° »

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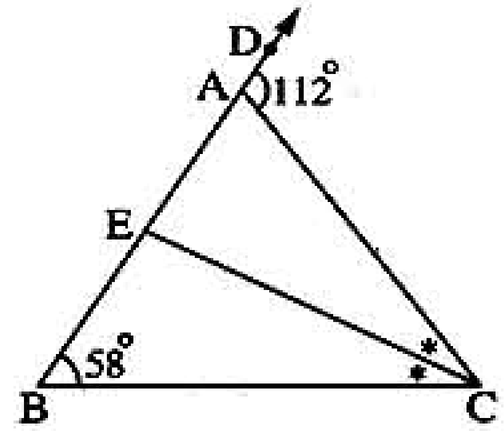
7 **In the opposite figure :**

ABC is a triangle in which : m (∠ B) = 58° ,

E ∈ $\overline{AB}$ such that $\overrightarrow{CE}$ bisects ∠ ACB ,

D ∈ $\overrightarrow{BA}$ and m (∠ CAD) = 112°

Find : m (∠ AEC)



« 85° »

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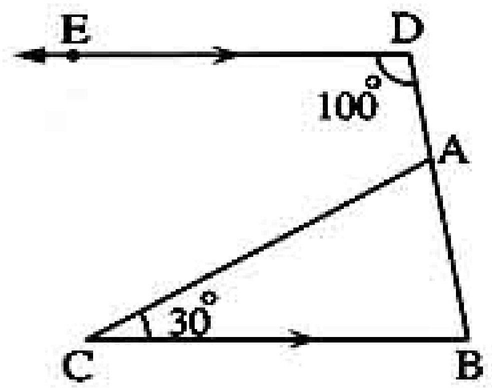
8 **In the opposite figure :**

$\overrightarrow{DE}$ // $\overline{BC}$, m (∠ D) = 100° ,

m (∠ C) = 30° and

A ∈ $\overline{DB}$

Find : m (∠ BAC)



« 70° »

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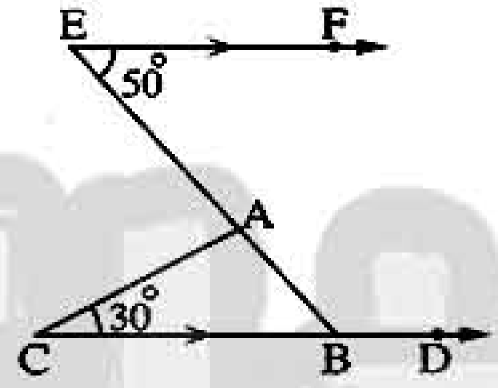
9 **In the opposite figure :**

$\overrightarrow{EF}$ // $\overrightarrow{CD}$, m (∠ E) = 50° and

m (∠ C) = 30°

Find the measures of the angles

of Δ ABC and m (∠ ABD)



« m (∠ ABC) = 50° , m (∠ BAC) = 100° , m (∠ ABD) = 130° »

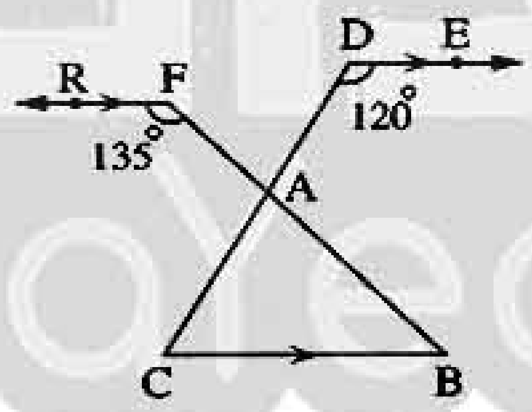
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10 **In the opposite figure :**

$\overrightarrow{DE}$ // $\overrightarrow{FR}$ // $\overline{BC}$,

m (∠ CDE) = 120° and m (∠ RFB) = 135°

Calculate the measures of the angles of Δ ABC



« m (∠ B) = 45° , m (∠ C) = 60° , m (∠ A) = 75° »

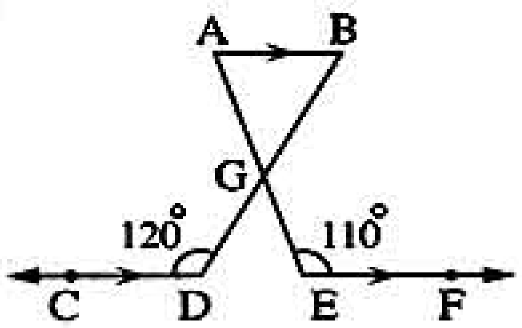
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11 **In the opposite figure :**

$\overline{AB}$ // $\overrightarrow{DC}$ // $\overrightarrow{EF}$, m (∠ E) = 110° and

m (∠ D) = 120°

Find : m (∠ EGD)



« 50° »

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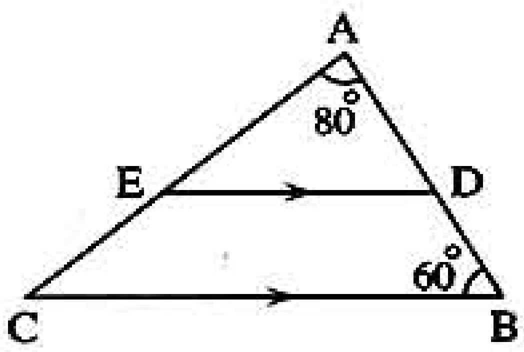
12 **In the opposite figure :**

ABC is a triangle in which : m (∠ A) = 80° and

m (∠ B) = 60°

$\overline{DE}$ // $\overline{BC}$ where : D ∈ $\overline{AB}$ and E ∈ $\overline{AC}$

Find : m (∠ AED) and m (∠ DEC)



« 40° , 140° »

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13 **In the opposite figure :**

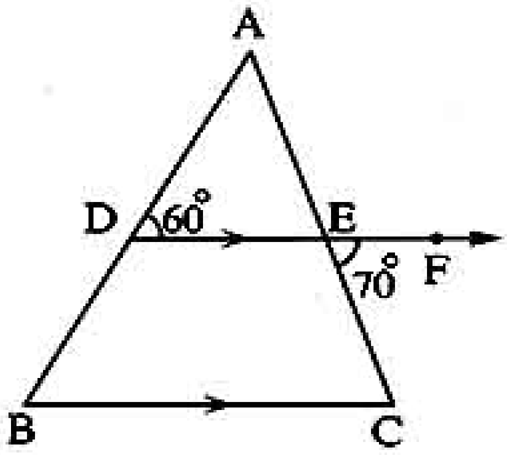
ABC is a triangle , m (∠ ADE) = 60° ,

m (∠ FEC) = 70° ,

D ∈ $\overline{AB}$, $\overrightarrow{DF}$ // $\overline{BC}$ and

$\overline{AC}$ ∩ $\overline{DF}$ = {E}

Find the measures of the interior angles of Δ ABC



« m (∠ C) = 70° , m (∠ B) = 60° , m (∠ A) = 50° »

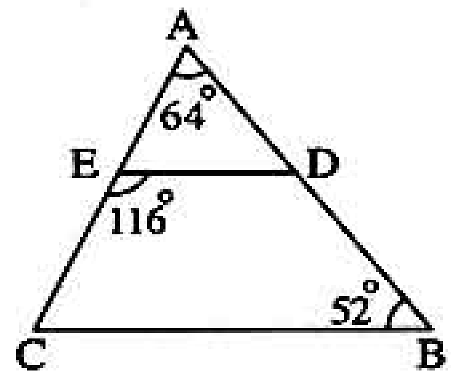
14 **In the opposite figure :**

ABC is a triangle in which m (∠ A) = 64° ,

m (∠ B) = 52° ,

m (∠ DEC) = 116° , E ∈ $\overline{AC}$ and D ∈ $\overline{AB}$

Prove that : $\overline{DE}$ // $\overline{BC}$



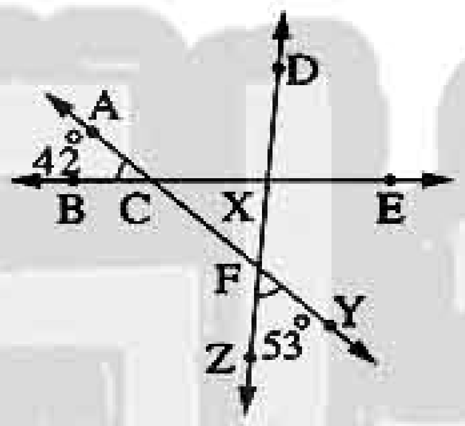
15 📖 **In the opposite figure :**

Prove that :

m (∠ DXE) = 85° ,

then calculate m (∠ DXC)

and m (∠ EXF)



« 95° , 95° »

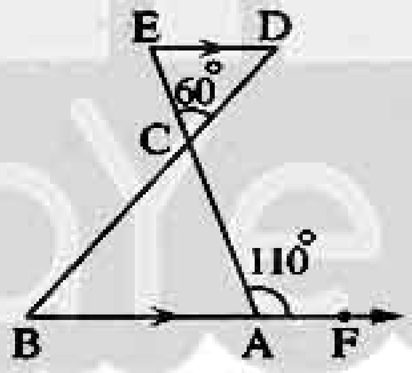
16 **In the opposite figure :**

$\overrightarrow{ED}$ // $\overrightarrow{BA}$, m (∠ CAF) = 110° ,

$\overline{DB}$ ∩ $\overline{AE}$ = {C} ,

m (∠ DCE) = 60° and F ∈ $\overrightarrow{BA}$

Find the measures of the angles of the two triangles DCE and ABC



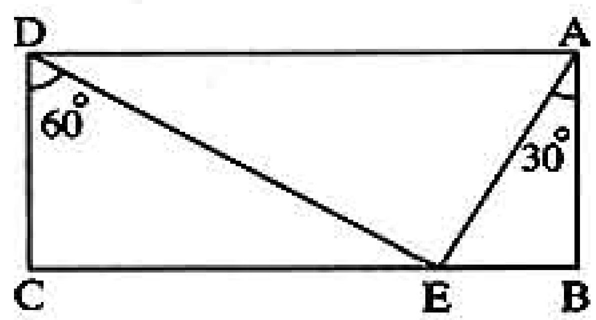
« m (∠ E) = 70° , m (∠ D) = 50° , m (∠ B) = 50° , m (∠ ACB) = 60° , m (∠ BAC) = 70° »

17 **In the opposite figure :**

ABCD is a rectangle , E ∈ $\overline{BC}$ where :

m (∠ BAE) = 30° and m (∠ EDC) = 60°

Find : m (∠ AED)



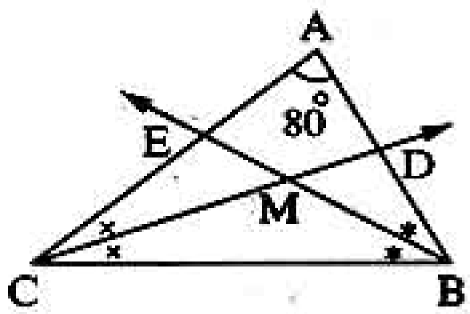
« 90° »

18 **In the opposite figure :**

$\overrightarrow{BM}$ bisects ∠ ABC and $\overrightarrow{CM}$ bisects ∠ ACB

If m (∠ A) = 80° ,

find : m (∠ EMD)



« 130° »

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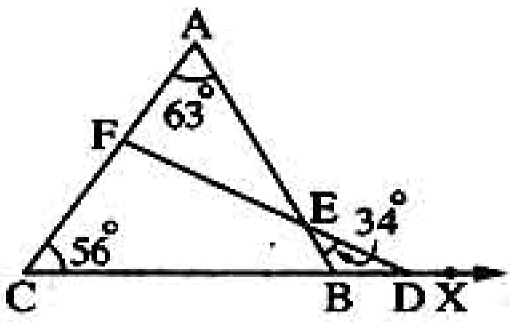
19 **In the opposite figure :**

ABC is a triangle , $D \in \overrightarrow{CB}$, $X \in \overrightarrow{CB}$,

m (∠ A) = 63° , m (∠ C) = 56° and

m (∠ DEB) = 34°

Find : m (∠ EDX)



« 153° »

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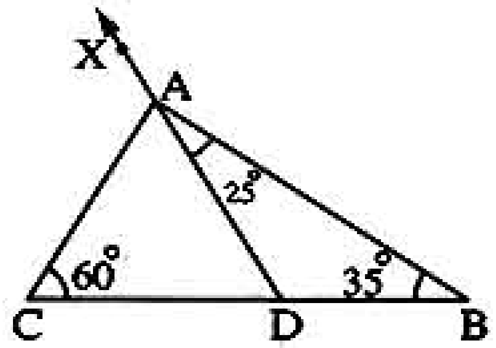
20 **In the opposite figure :**

ABC is a triangle , m (∠ B) = 35° ,

m (∠ C) = 60° , m (∠ BAD) = 25° ,

$D \in \overline{BC}$ and $X \in \overrightarrow{DA}$

Find : m (∠ XAC)



« 120° »

---

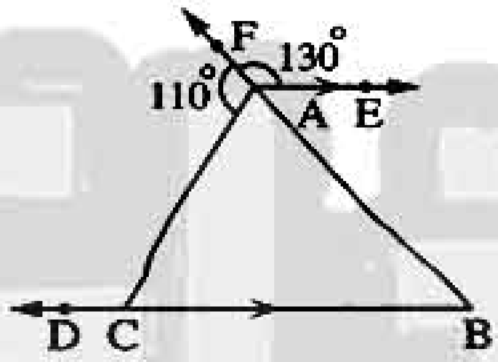
21 **In the opposite figure :**

ABC is a triangle , $\overrightarrow{AE} \parallel \overline{BC}$, $D \in \overleftrightarrow{BC}$,

$F \in \overrightarrow{BA}$, m (∠ FAE) = 130° and

m (∠ FAC) = 110°

Find : m (∠ ACD)



« 120° »

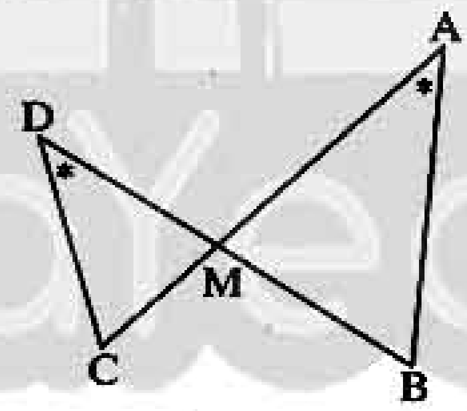
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22 **In the opposite figure :**

$\overline{AC} \cap \overline{BD} = \{M\}$ and

m (∠ A) = m (∠ D)

Prove that : m (∠ B) = m (∠ C)



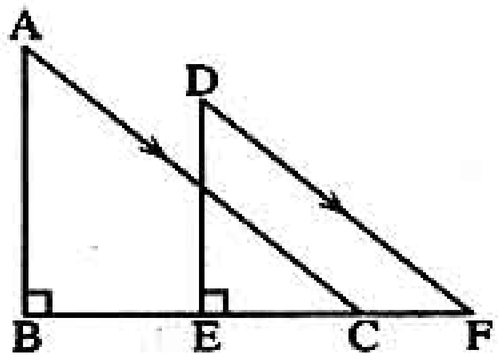
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23 **In the opposite figure :**

The points F , C , E and B are collinear ,

m (∠ B) = m (∠ DEC) = 90° and $\overline{AC} \parallel \overline{DF}$

Prove that : m (∠ A) = m (∠ D)



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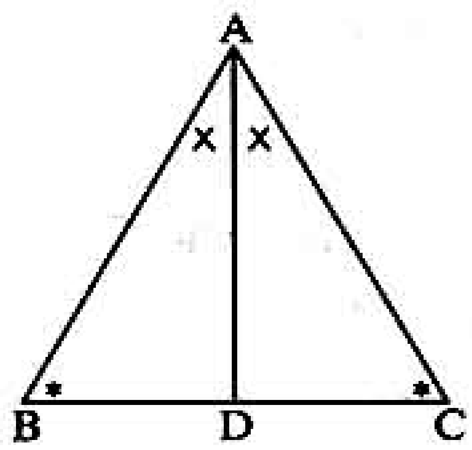
24 **In the opposite figure :**

ABC is a triangle ,

m (∠ B) = m (∠ C) and

$\overrightarrow{AD}$ is the bisector of ∠ A

Prove that : AB = AC



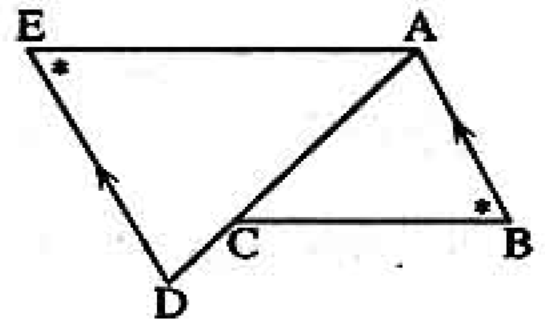
هذا العمل خاص بموقع ذاكرولى التعليمى ولا يسمح بتداوله على مواقع أخرى

25 **In the opposite figure :**

$\overline{AB} \parallel \overline{ED}$ and

m (∠ ABC) = m (∠ AED)

Prove that : $\overline{BC} \parallel \overline{AE}$



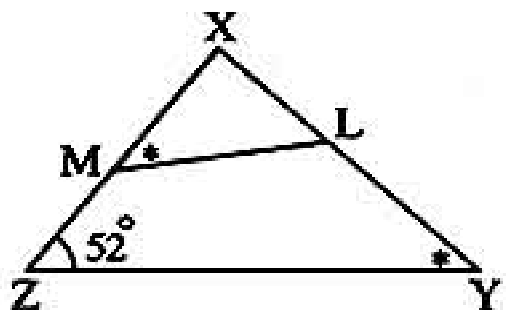
26 **In the opposite figure :**

XYZ is a triangle in which m (∠ Z) = 52° ,

L ∈ $\overline{XY}$ and M ∈ $\overline{XZ}$ such that :

m (∠ Y) = m (∠ XML)

Find : m (∠ XLM)



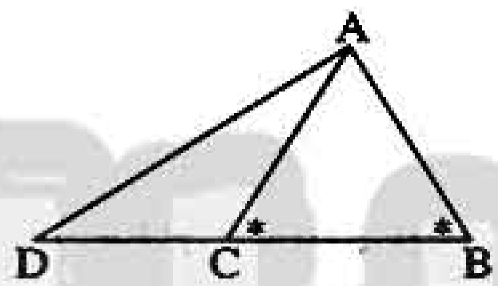
« 52° »

27 **In the opposite figure :**

ABC is a triangle in which :

m (∠ B) = m (∠ ACB) and D ∈ $\overrightarrow{BC}$

Prove that : m (∠ B) > m (∠ D)



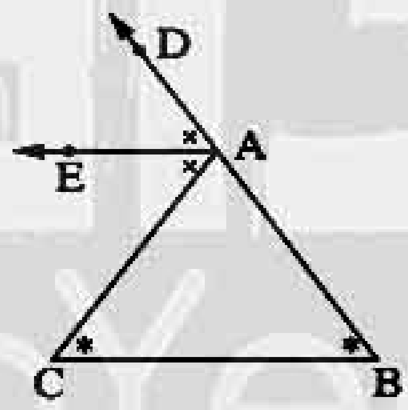
28 **In the opposite figure :**

ABC is a triangle in which :

m (∠ B) = m (∠ C) , D ∈ $\overrightarrow{BA}$ and

$\overrightarrow{AE}$ bisects ∠ DAC

Prove that : $\overrightarrow{AE} \parallel \overline{BC}$



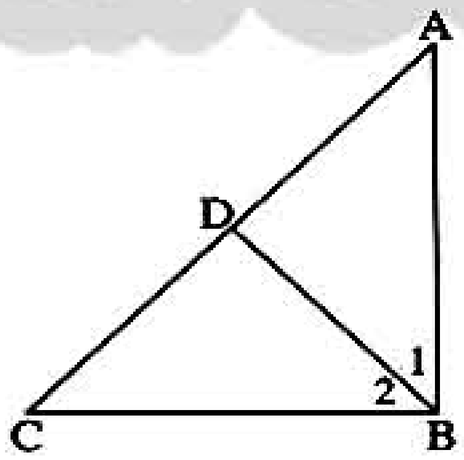
29 **In the opposite figure :**

ABC is a triangle in which : D ∈ $\overline{AC}$,

m (∠ 1) = m (∠ A) and

m (∠ 2) = m (∠ C)

Prove that : ∠ ABC is a right angle.



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كتاب المعاصر موقع ذاكرولى التعليمى الصف الاول الاعدادى

Unit 3

For excellent pupils

30 ABC is a triangle in which : m ($\angle$ A) = 2 m ($\angle$ C) and m ($\angle$ B) = 4 m ($\angle$ C)

Prove that : $\angle$ B is an obtuse angle.

---

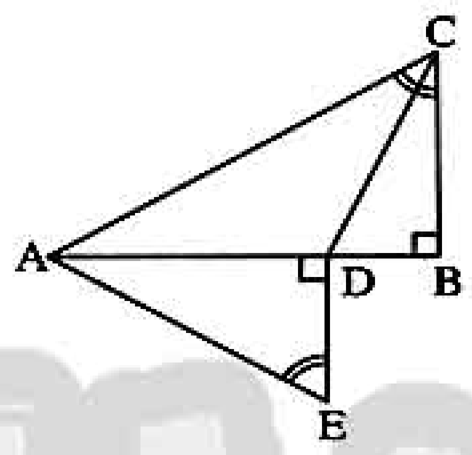
31 ABC is a triangle in which : m ($\angle$ C) = 28° , m ($\angle$ A) = $4x$°

, m ($\angle$ B) = $(2x + 2)$°

Find : m ($\angle$ A) and m ($\angle$ B) « 100° , 52° »

---

32 **In the opposite figure :**



ABC is a triangle in which : D $\in \overline{AB}$

m ($\angle$ B) = 90° , m ($\angle$ ADE) = 90° and

m ($\angle$ ACB) = m ($\angle$ E)

Prove that : m ($\angle$ BDC) > m ($\angle$ DAE)

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From the school book

Exercise 6 On theorem 2 and its corollary, and theorem 3

1 Complete the following :

(1) The ray drawn from the midpoint of a side of a triangle parallel to another side ....

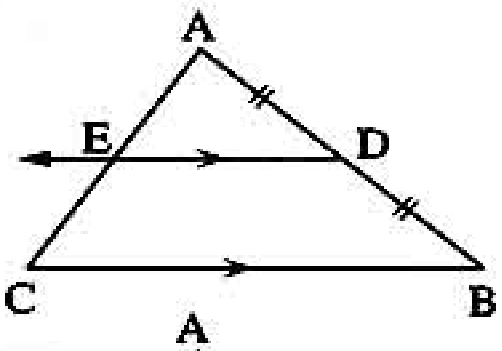
(2) The line segment joining the midpoints of two sides of a triangle is .... the third side.

(3) The length of the line segment joining the midpoints of two sides of a triangle equals ....

(4) **In the opposite figure :**

If D is the midpoint of $\overline{AB}$, $\overrightarrow{DE}$ // $\overline{BC}$

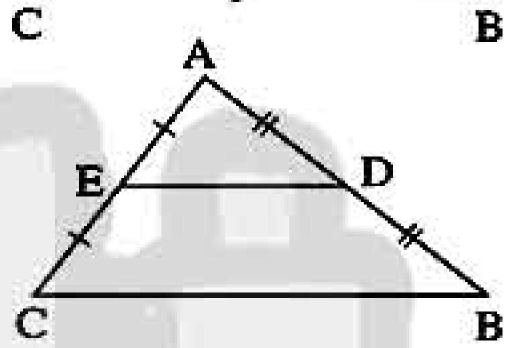
, then : .... is the midpoint of ....



(5) **In the opposite figure :**

If D and E are the midpoints of $\overline{AB}$ and $\overline{AC}$ respectively

, then : .... // ....

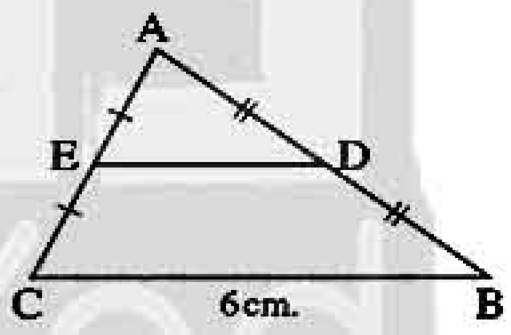


(6) **In the opposite figure :**

∵ D and E are the midpoints of $\overline{AB}$ and $\overline{AC}$ respectively

, BC = 6 cm.

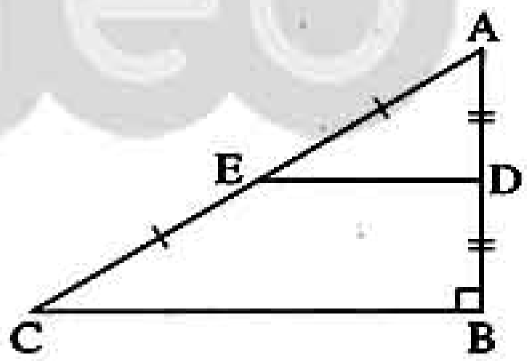
∴ DE = ... cm



(7) **In the opposite figure :**

If : m (∠ B) = 90° , D and E are the midpoints of $\overline{AB}$ and $\overline{AC}$ respectively

, then : m (∠ ADE) = ...°

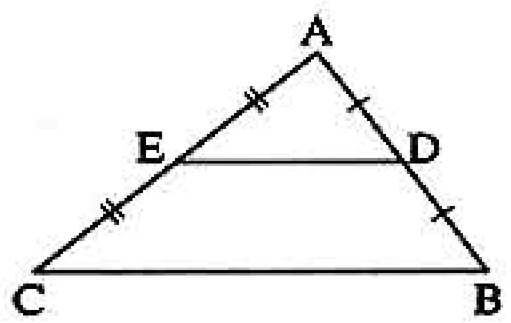


(8) **In the opposite figure :**

If : D and E are the midpoints of $\overline{AB}$ and $\overline{AC}$ respectively

, and the perimeter of the triangle ABC = 24 cm.

, then the perimeter of the triangle ADE = ... cm.

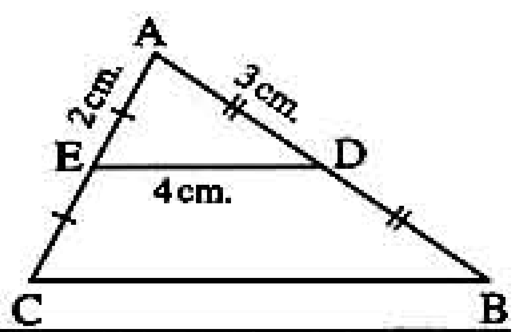


(9) **In the opposite figure :**

∵ D and E are the midpoints of $\overline{AB}$ and $\overline{AC}$ respectively

, AD = 3 cm. , AE = 2 cm. and DE = 4 cm.

∴ The perimeter of the figure DBCE = ... cm.



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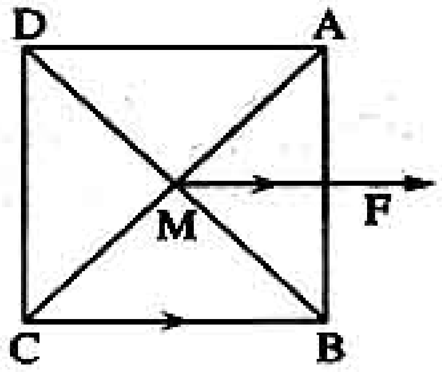
Unit 3

● **In the opposite figure :**

If the perimeter of the square ABCD = 20 cm.

, $\overrightarrow{MF}$ // $\overline{CB}$ where F ∈ $\overline{AB}$

, then : AF = ……… cm.

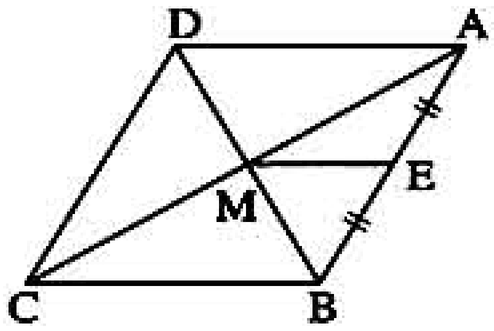


● **In the opposite figure :**

∵ The perimeter of the rhombus ABCD = 24 cm. ,

E is the midpoint of $\overline{AB}$

∴ ME = ……… cm.

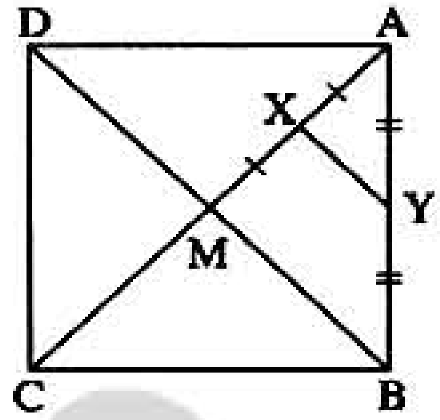


● **In the opposite figure :**

∵ ABCD is a square , X and Y are the midpoints

of $\overline{AM}$ and $\overline{AB}$ respectively and AC = 12 cm.

∴ XY = ……… cm. , m (∠ AYX) = ………°



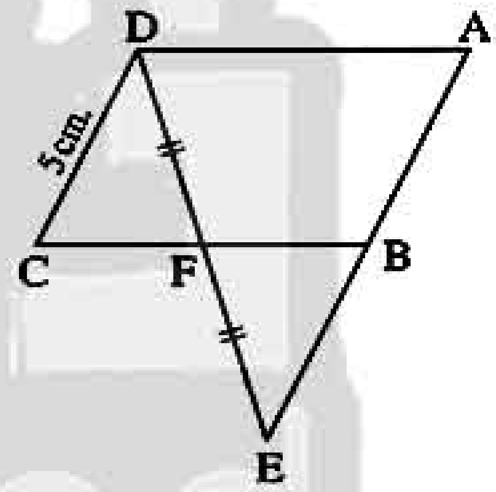
2 **In the opposite figure :**

ABCD is a parallelogram , DC = 5 cm.

, F ∈ $\overline{BC}$, $\overrightarrow{DF}$ ∩ $\overrightarrow{AB}$ = {E} ,

if : DF = FE

Complete the following proof to find the length of $\overline{BE}$



Given ………………………………………………

R.T.F. ………………………………………………

Proof

∵ ABCD is a ………………

∴ $\overline{AD}$ // ……… ∴ $\overline{BF}$ // ………

, In Δ AED :

∵ F is the midpoint of ……… , $\overline{BF}$ // ………

∴ B is the midpoint of ………

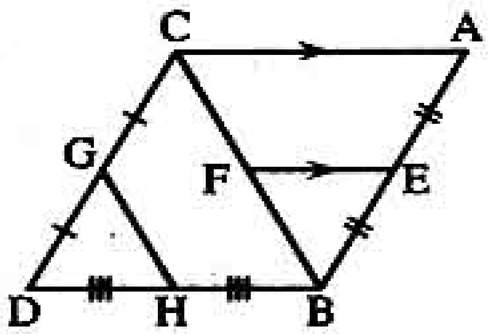
∴ AB = ………

, ∵ AB = ……… = ……… cm. (Properties of ………………)

∴ BE = ……… cm. (The req.)

ذاكرولى
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3 **In the opposite figure :**



ABC is a triangle in which CA = CB ,

E is the midpoint of $\overline{AB}$, $\overline{EF}$ // $\overline{AC}$,

H and G are the two midpoints of $\overline{BD}$ and $\overline{CD}$ respectively.

Complete the following proof to prove that : EF = GH

Given ....

R.T.P. ....

Proof

In Δ ABC :

∵ E is the midpoint of .... , $\overline{EF}$ // ....

∴ F is the midpoint of ....

∴ EF = $\frac{1}{2}$ ....

, In Δ BDC :

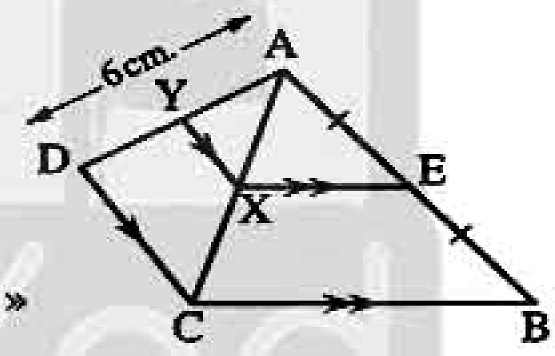
∵ H is the midpoint of ....

, ... is the midpoint of $\overline{CD}$

∴ GH = $\frac{1}{2}$ ....

, ∵ CA = ... ∴ EF = ... (Q.E.D.)

4 **In the opposite figure :**

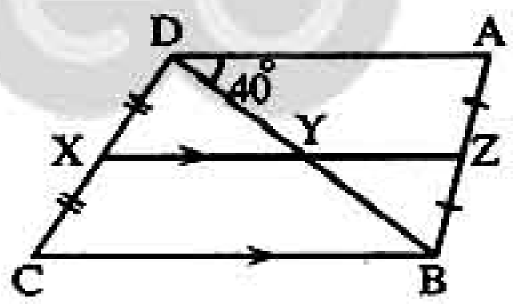


AE = EB , $\overline{EX}$ // $\overline{BC}$, $\overline{XY}$ // $\overline{CD}$

and AD = 6 cm.

Find the length of : $\overline{AY}$ « 3 cm. »

5 **In the opposite figure :**



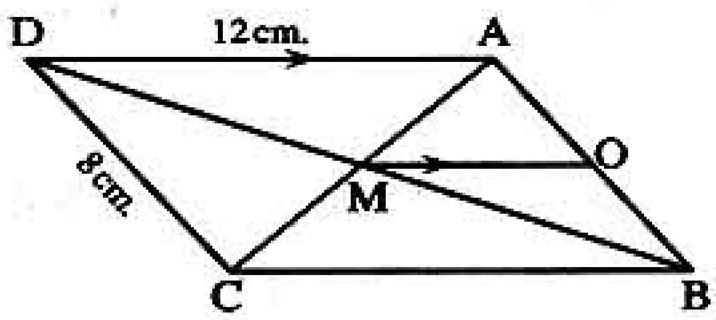
X is the midpoint of $\overline{CD}$

, Z is the midpoint of $\overline{AB}$

, $\overline{XY}$ // $\overline{CB}$, m (∠ ADB) = 40°

Find : m (∠ ZYB) « 40° »

6 **In the opposite figure :**



ABCD is a parallelogram , $\overline{AC}$ ∩ $\overline{BD}$ = {M}

Draw $\overline{MO}$ // $\overline{AD}$ to cut $\overline{AB}$ at O

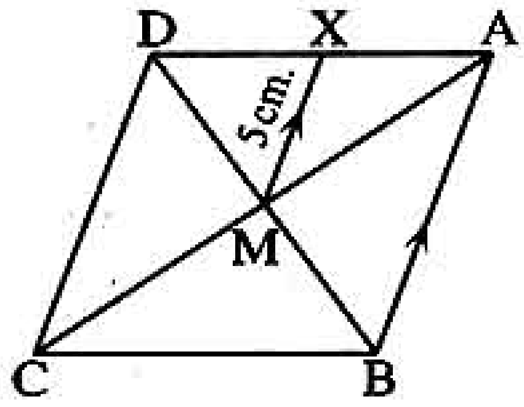
If : AD = 12 cm. and DC = 8 cm.

, then find : (1) The perimeter of ABCD

(2) The length of $\overline{AO}$ « 40 cm. , 4 cm. »

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7 **In the opposite figure :**



ABCD is a parallelogram , its diagonals intersect at M

Draw $\overrightarrow{MX}$ // $\overline{BA}$ to intersect $\overline{AD}$ at X

(1) **Prove that :** X is the midpoint of $\overline{AD}$

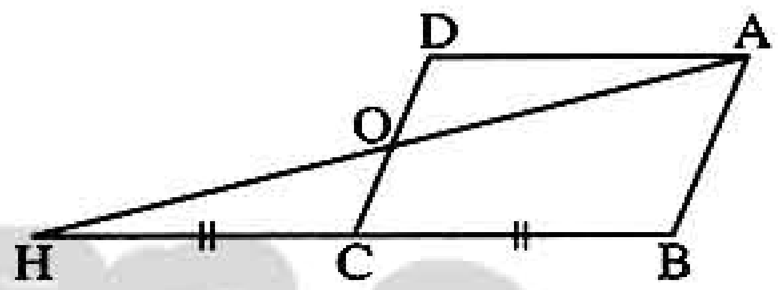
(2) If MX = 5 cm. , then find the length of $\overline{CD}$

« 10 cm. »

8 ABCD is a parallelogram , its diagonals intersect at M , $\overrightarrow{ME}$ // $\overline{BA}$ and cuts $\overline{AD}$ at E

Prove that : ME = $\frac{1}{2}$ DC

9 **In the opposite figure :**



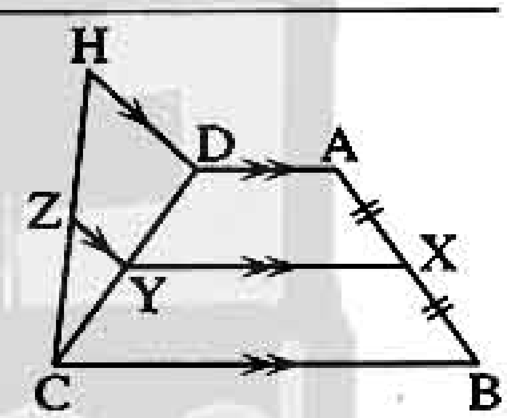
ABCD is a parallelogram ,

BC = CH , H ∈ $\overrightarrow{BC}$

Draw $\overline{AH}$ to cut $\overline{DC}$ at O

Prove that : AO = OH

10 **In the opposite figure :**

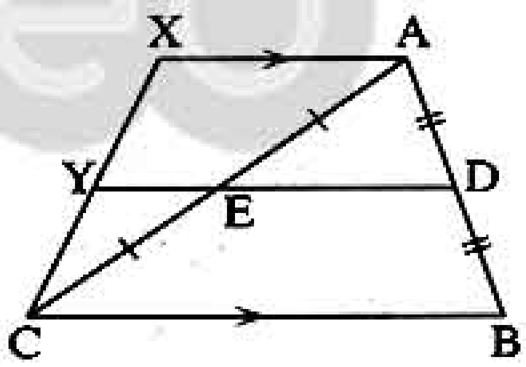


ABCD is a trapezium , $\overline{AD}$ // $\overline{BC}$, X is the midpoint of $\overline{AB}$

If $\overline{AD}$ // $\overline{XY}$ where Y ∈ $\overline{DC}$, $\overline{YZ}$ // $\overline{DH}$

Prove that : CZ = ZH

11 📖 **In the opposite figure :**

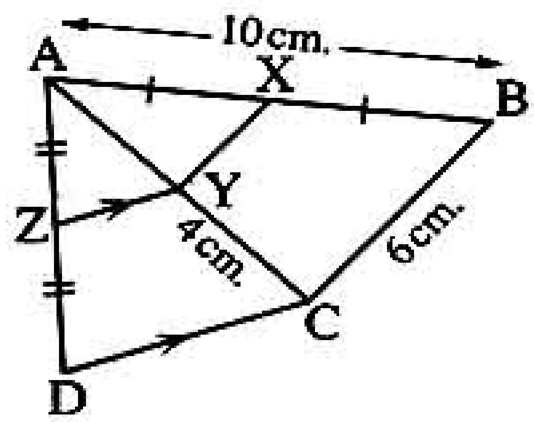


AD = DB , AE = EC ,

$\overline{AX}$ // $\overline{BC}$, $\overline{DE}$ ∩ $\overline{XC}$ = {Y}

Prove that : Y is the midpoint of $\overline{XC}$

12 **In the opposite figure :**



ABCD is a quadrilateral in which :

X and Z are the midpoints of $\overline{AB}$

and $\overline{AD}$ respectively and Y ∈ $\overline{AC}$ such that :

$\overline{YZ}$ // $\overline{CD}$ and YC = 4 cm.

If BC = 6 cm. and AB = 10 cm. , then

find : (1) The length of $\overline{AY}$ (2) The perimeter of Δ AXY « 4 cm. , 12 cm. »

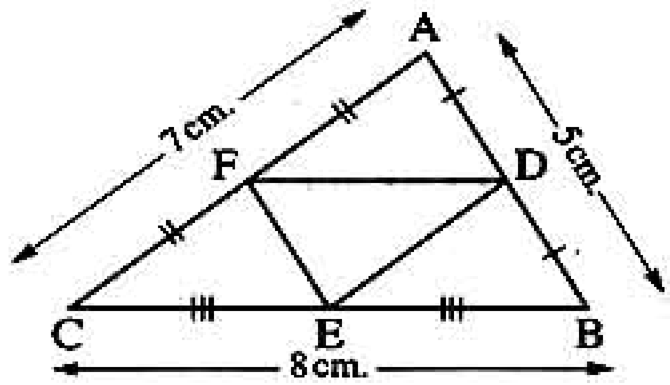
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13 **In the opposite figure :**

AB = 5 cm., BC = 8 cm.,

AC = 7 cm., D, E and F are the midpoints of $\overline{AB}$, $\overline{BC}$ and $\overline{CA}$ respectively.

Calculate the perimeter of : Δ DEF



« 10 cm. »

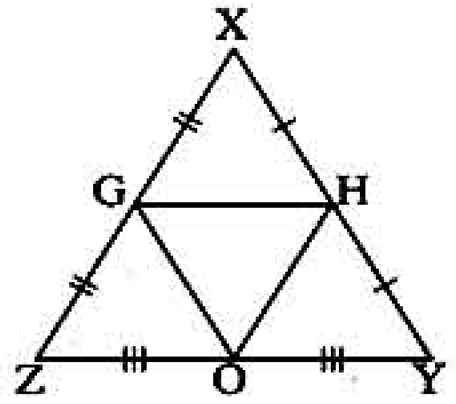
14 **In the opposite figure :**

XYZ is a triangle in which :

H, O and G are the midpoints of $\overline{XY}$, $\overline{YZ}$ and $\overline{ZX}$ respectively.

If the perimeter of Δ HOG is 18 cm.,

then find the perimeter of : Δ XYZ



« 36 cm. »

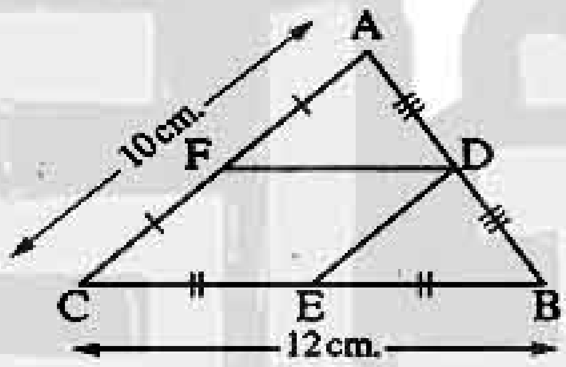
15 ABC is a triangle, if X, Y and Z are the midpoints of $\overline{AB}$, $\overline{BC}$ and $\overline{AC}$ respectively. **Prove that :** the perimeter of Δ XYZ = $\frac{1}{2}$ that of Δ ABC

16 **In the opposite figure :**

ABC is a triangle in which D, E and F are the midpoints of $\overline{AB}$, $\overline{BC}$ and $\overline{CA}$ respectively,

BC = 12 cm., AC = 10 cm.

Find the perimeter of the figure DECF



« 22 cm. »

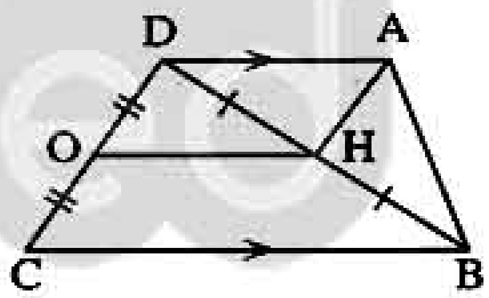
17 **In the opposite figure :**

$\overline{AD}$ // $\overline{BC}$, AD = $\frac{1}{2}$ BC,

H is the midpoint of $\overline{BD}$,

O is the midpoint of $\overline{CD}$

Prove that : AHOD is a parallelogram.

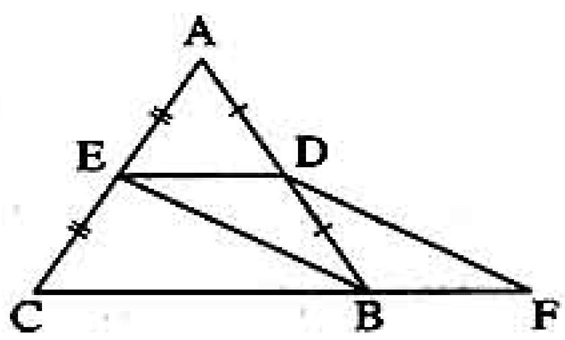


18 **In the opposite figure :**

D and E are the midpoints of $\overline{AB}$ and $\overline{AC}$ respectively,

F ∈ $\overrightarrow{CB}$ where BF = $\frac{1}{2}$ BC

Prove that : BEDF is a parallelogram.



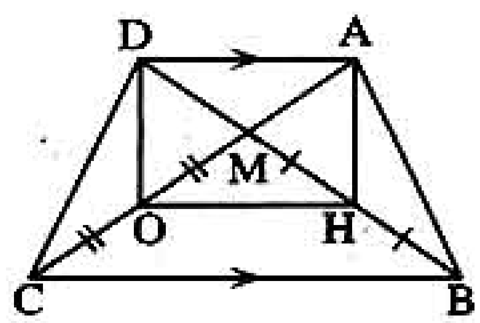
19 **In the opposite figure :**

ABCD is a trapezium in which $\overline{AD}$ // $\overline{BC}$

and AD = $\frac{1}{2}$ BC and $\overline{AC}$ ∩ $\overline{DB}$ = {M}

Let H and O are the midpoints of $\overline{MB}$ and $\overline{MC}$ respectively.

Prove that : AHOD is a parallelogram.



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20 **In the opposite figure :**

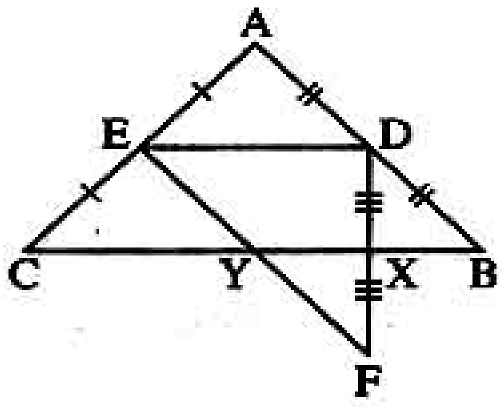
D is the midpoint of $\overline{AB}$,

E is the midpoint of $\overline{AC}$,

$\overline{DF} \cap \overline{BC} = \{X\}$, DX = XF ,

BC = 12 cm.

Find the length of : $\overline{XY}$



« 3 cm. »

---

21 **In the opposite figure :**

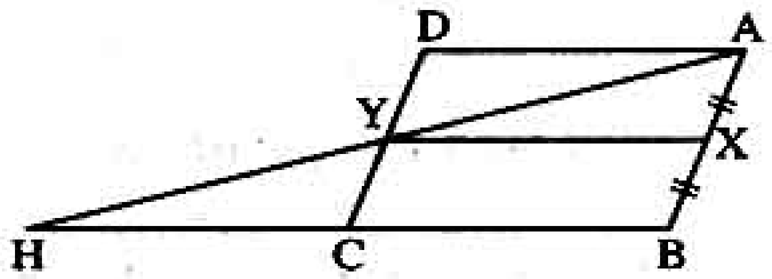
ABCD is a parallelogram ,

X is the midpoint of $\overline{AB}$

Draw $\overrightarrow{XY}$ // $\overline{BC}$ to cut $\overline{DC}$ at Y

Draw $\overrightarrow{AY}$ to cut $\overrightarrow{BC}$ at H

Prove that : C is the midpoint of $\overline{BH}$



---

22 **In the opposite figure :**

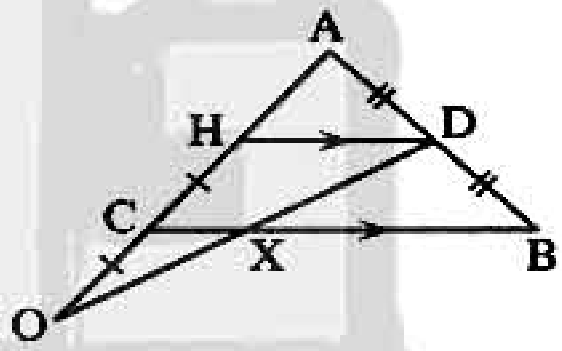
ABC is a triangle , D is the midpoint of $\overline{AB}$,

$\overrightarrow{DH}$ // $\overline{BC}$, O $\in \overrightarrow{AC}$ such that HC = CO

Prove that : CO = $\frac{1}{3}$ AO

If we draw $\overline{DO}$ to cut $\overline{BC}$ at X , then

prove that : OX = XD



---

23 **In the opposite figure :**

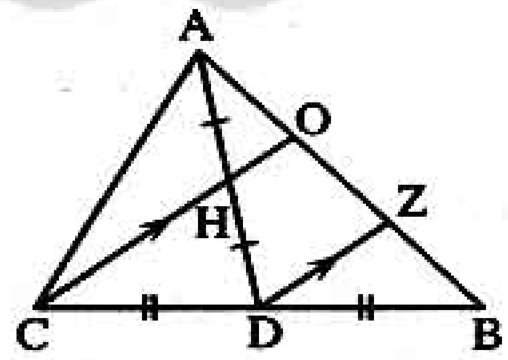
ABC is a triangle , D is the midpoint of $\overline{BC}$

and H is the midpoint of $\overline{AD}$

Draw $\overrightarrow{CH}$ to cut $\overline{AB}$ at O ,

then draw $\overrightarrow{DZ}$ // $\overline{CO}$ to cut $\overline{AB}$ at Z

Prove that : AO = OZ = ZB



---

24 ABCD is a parallelogram. M is the intersection point of its diagonals ,

draw $\overrightarrow{CE}$ // $\overline{BD}$ to cut $\overrightarrow{AB}$ at E and $\overrightarrow{AD}$ at F

Prove that : ⬤ AB = BE ⬤ AD = DF

Rania SaYed

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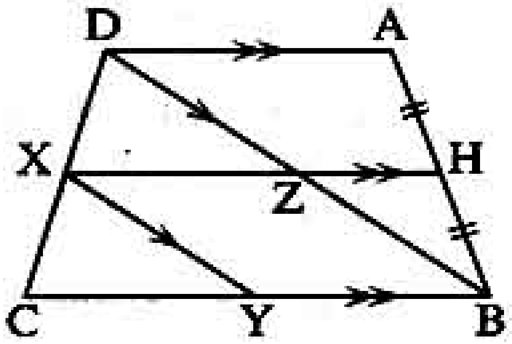
25 **In the opposite figure :**

ABCD is a trapezium in which $\overline{AD} \mathbin{/\!/} \overline{BC}$

Let H be the midpoint of $\overline{AB}$,

$\overline{HX} \mathbin{/\!/} \overline{BC}$ and $\overline{XY} \mathbin{/\!/} \overline{DB}$

Prove that : Y is the midpoint of $\overline{BC}$



26 ABCD is a trapezium in which $\overline{AD} \mathbin{/\!/} \overline{BC}$, E is the midpoint of $\overline{AB}$, draw $\overrightarrow{EX} \mathbin{/\!/} \overline{BC}$ to cut $\overline{DB}$ at X , $\overline{DC}$ at Y , and draw $\overrightarrow{YZ} \mathbin{/\!/} \overline{DB}$ to cut $\overline{BC}$ at Z

Prove that : XD = YZ

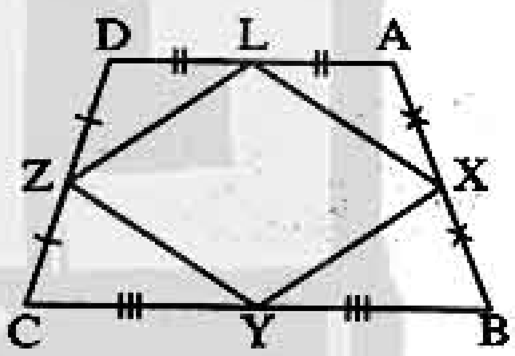
27 ABC is a triangle in which AB = 9 cm. , AC = 8 cm. , D $\in \overline{AB}$, E $\in \overline{AB}$ such that AD = DE = EB and $\overrightarrow{DX}$, $\overrightarrow{EY}$ are drawn parallel to $\overline{BC}$ and cutting $\overline{AC}$ at X and Y respectively , where DX = 4 cm.

Calculate : the perimeter of the shape DEYX « $17\frac{2}{3}$ cm. »

28 **In the opposite figure :**

ABCD is a quadrilateral in which X , Y , Z and L are the midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{CD}$ and $\overline{DA}$ respectively.

Prove that : XYZL is a parallelogram.



29 ABC is a triangle in which AB = AC , X , Y and Z are the midpoints of $\overline{AB}$, $\overline{BC}$ and $\overline{CA}$ respectively.

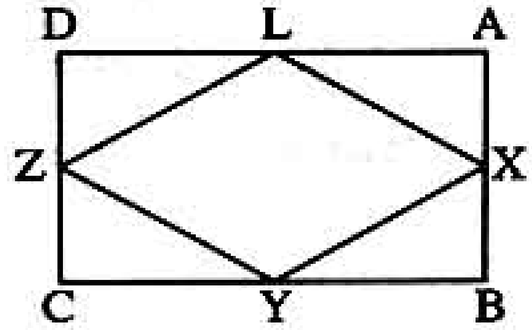
Prove that : AXYZ is a rhombus.

30 **In the opposite figure :**

ABCD is a rectangle and X , Y , Z and L are the midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{CD}$ and $\overline{DA}$ respectively.

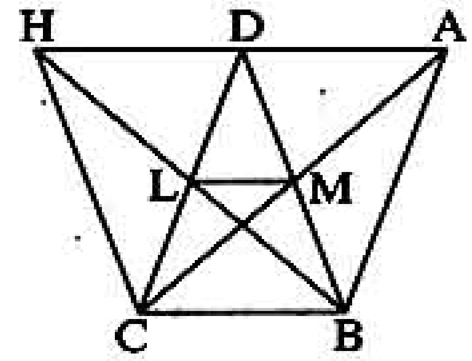
Prove that :

- XYZL is a rhombus.
- The perimeter of the rhombus = 2 BD



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31 **In the opposite figure :**



ABCD and DBCH are two parallelograms having a common base $\overline{BC}$ and on one side of $\overline{BC}$

Let $\overline{AC} \cap \overline{BD} = \{M\}$ and $\overline{DC} \cap \overline{BH} = \{L\}$

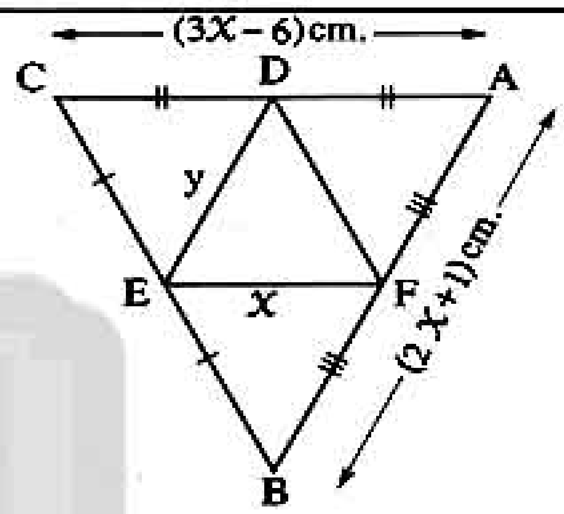
Prove that : (1) $\overline{ML} \parallel \overline{BC}$ (2) $ML = \frac{1}{4} AH$

---

32 **Connected with algebra :**

In the opposite figure :

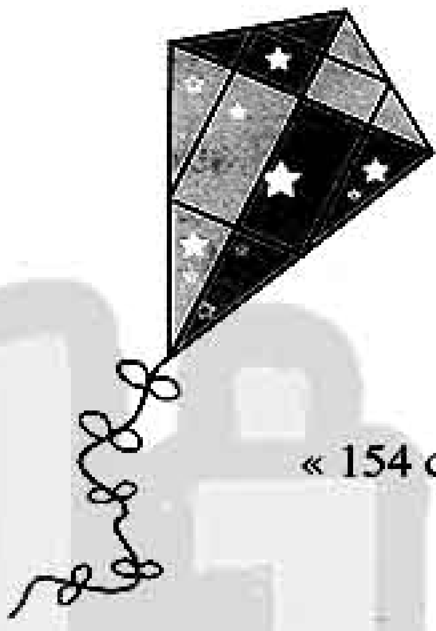
Find the value of each of : X and y



« 6 cm. , 6.5 cm. »

Life Application

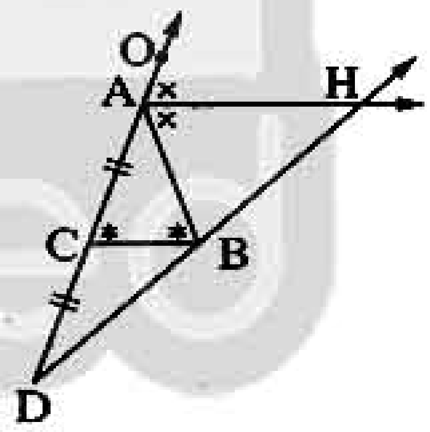
33 Sara wants to design a kite whose two diagonals are 64 cm. and 90 cm.
She want to put a stripe to decorate the kite such that the stripe joins between the midpoints of the sides of the kite.
How long is the stripe ?



« 154 cm. »

For excellent pupils

34 **In the opposite figure :**



ABC is a triangle in which : m (∠ ABC) = m (∠ ACB)

, $D \in \overrightarrow{AC}$ such that AC = CD and $O \in \overrightarrow{CA}$

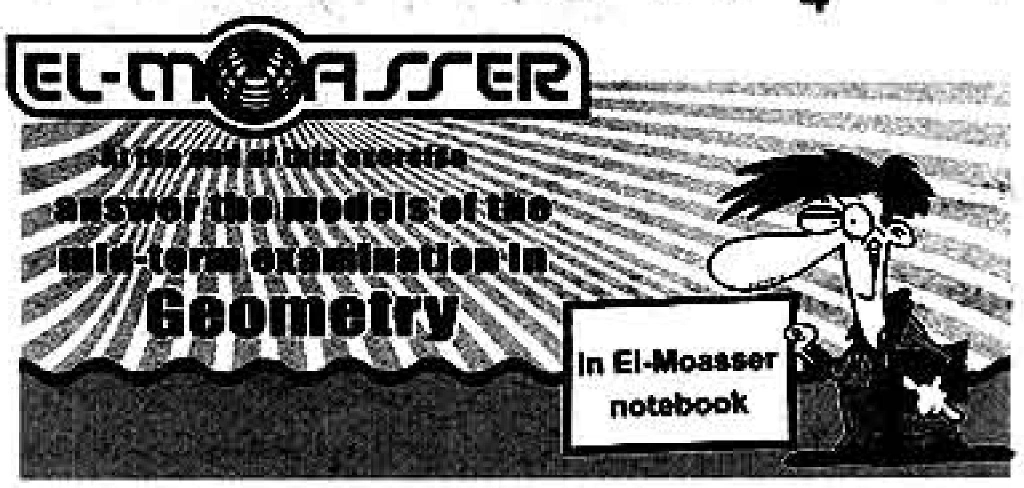
Let $\overrightarrow{AH}$ bisects ∠ BAO such that : $\overrightarrow{AH} \cap \overrightarrow{DB} = \{H\}$

Prove that : DB = BH

---

35 ABCD is a quadrilateral in which $\overline{AC} \perp \overline{BD}$ and X , Y , Z and L are the midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{CD}$ and $\overline{DA}$ respectively.

Prove that : XYZL is a rectangle whose area equals $\frac{1}{4}$ AC × BD



From the school book

Exercise 7 On Pythagoras' theorem

1 **In each of the following figures , find the length of the unknown side :**

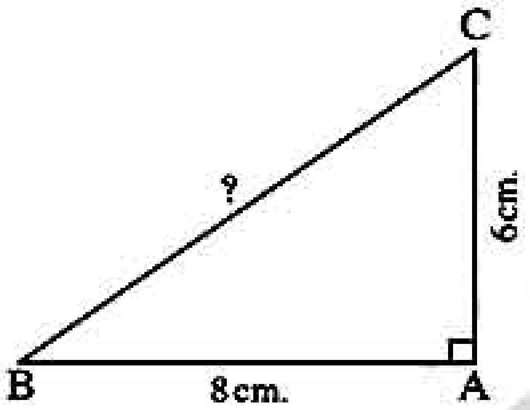


Fig. (1)

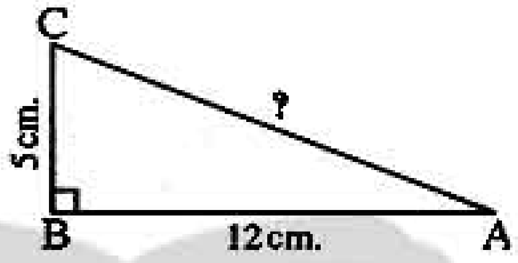


Fig. (2)

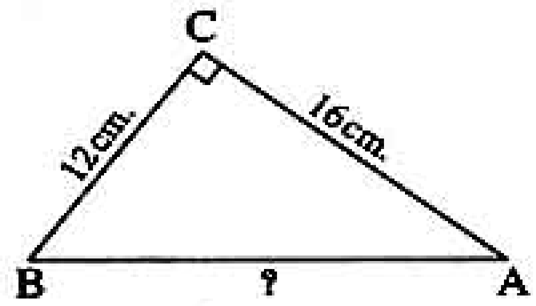


Fig. (3)

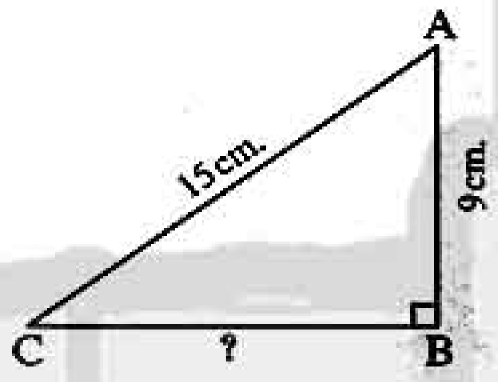


Fig. (4)

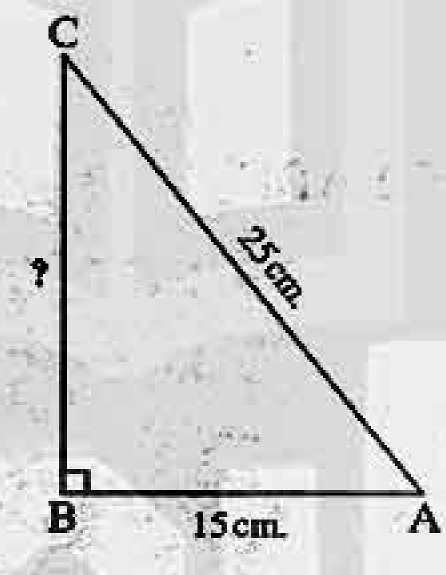


Fig. (5)

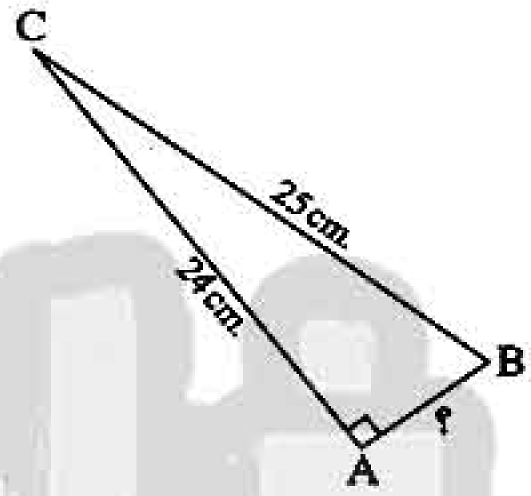
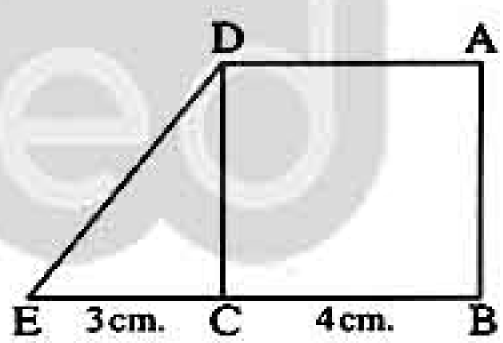


Fig. (6)

2 **In the opposite figure :**



ABCD is a square whose side length = 4 cm.

and E $\in \overrightarrow{BC}$ where CE = 3 cm.

Complete the following proof to find the length of $\overline{DE}$

$\because$ ABCD is a square

$\therefore$ DC = ……… cm. , m ($\angle$ DCB) = ………°

$\therefore$ In Δ DCE : $(DE)^2$ = (………$)^2$ + $(CE)^2$ = (………$)^2$ + $(3)^2$

= ……… + ……… = ………

$\therefore$ DE = ……… cm. (The req.)

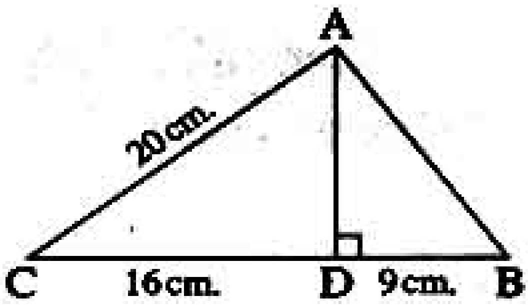
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3 In the opposite figure :

$\overline{AD} \perp \overline{BC}$, BD = 9 cm. ,

DC = 16 cm. and AC = 20 cm.

Find :



- AD
- AB
- The area of Δ ABC

« 12 cm. , 15 cm. , 150 cm^2. »

---

4 In the opposite figure :

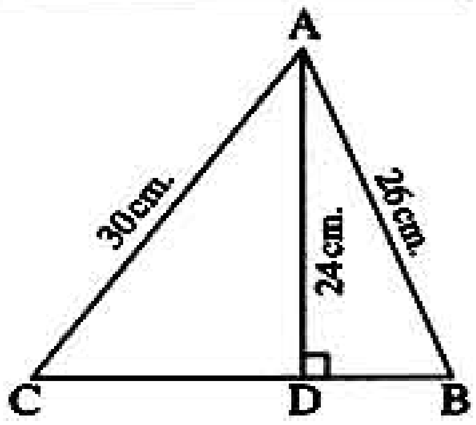
ABC is a triangle and $\overline{AD} \perp \overline{BC}$

If AD = 24 cm.

, AB = 26 cm.

and AC = 30 cm.

find BC and calculate the area of Δ ABC



« 28 cm. , 336 cm^2. »

---

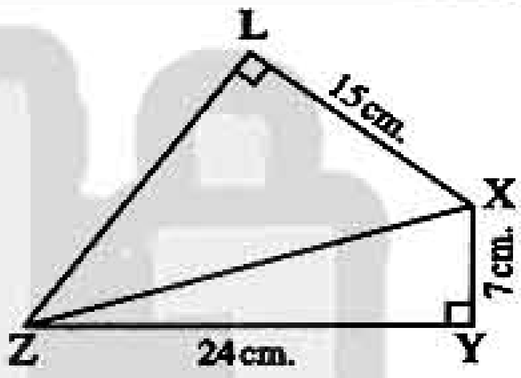
5 In the opposite figure :

XYZL is a quadrilateral in which :

m ($\angle$ XYZ) = m ($\angle$ XLZ) = 90° ,

XY = 7 cm. , YZ = 24 cm. and XL = 15 cm.

Find the length of each of : $\overline{XZ}$ and $\overline{ZL}$



« 25 cm. , 20 cm. »

---

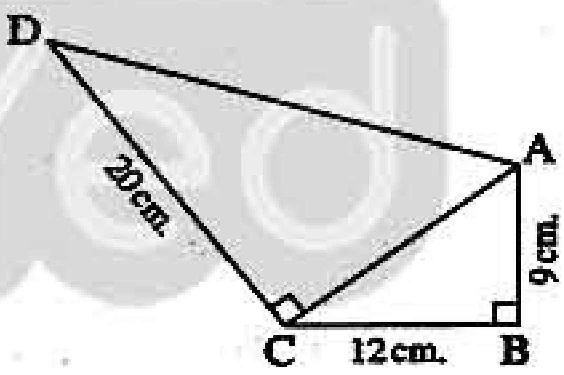
6 In the opposite figure :

m ($\angle$ B) = m ($\angle$ ACD) = 90°

, AB = 9 cm. , BC = 12 cm.

and DC = 20 cm.

Find :



- The length of $\overline{AC}$
- The length of $\overline{AD}$
- The perimeter of the figure ABCD
- The area of the figure ABCD

« 15 cm. , 25 cm. , 66 cm. , 204 cm^2. »

---

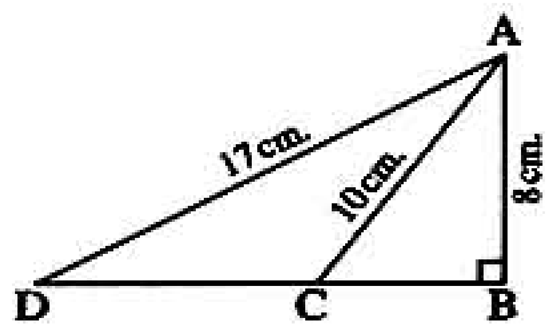
7 In the opposite figure :

Δ ABD is a right-angled triangle at B

, AB = 8 cm. , AD = 17 cm.

and C $\in \overline{BD}$ such that AC = 10 cm.

Find the length of each of : $\overline{CB}$, $\overline{BD}$ and $\overline{CD}$



« 6 cm. , 15 cm. , 9 cm. »

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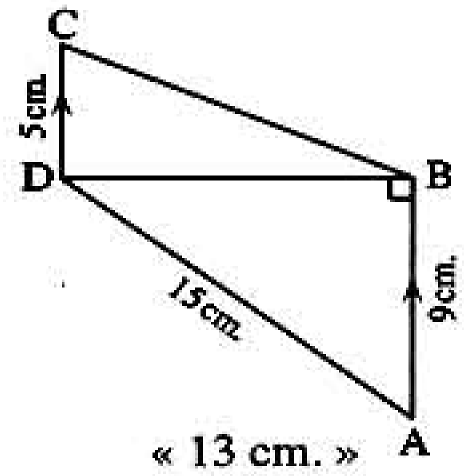
8 **In the opposite figure :**

m (∠ ABD) = 90° , $\overline{BA}$ // $\overline{CD}$

, AB = 9 cm. , AD = 15 cm.

and DC = 5 cm.

Calculate the length of : $\overline{BC}$



« 13 cm. »

9 **In the opposite figure :**

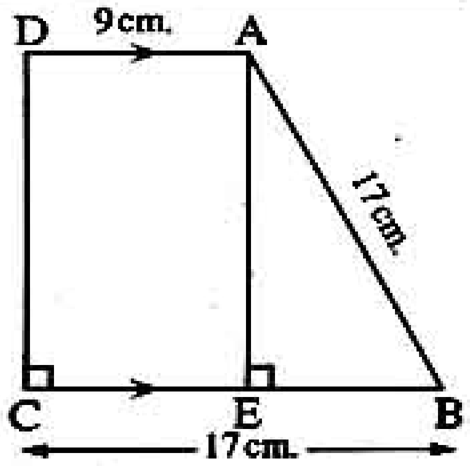
ABCD is a trapezium , $\overline{AD}$ // $\overline{BC}$

, m (∠ DCB) = 90° , $\overline{AE} \perp \overline{BC}$

If : AB = BC = 17 cm. and AD = 9 cm.

, find the length of $\overline{DC}$ and calculate

the area of the trapezium ABCD



« 15 cm. , 195 cm.^{2} »

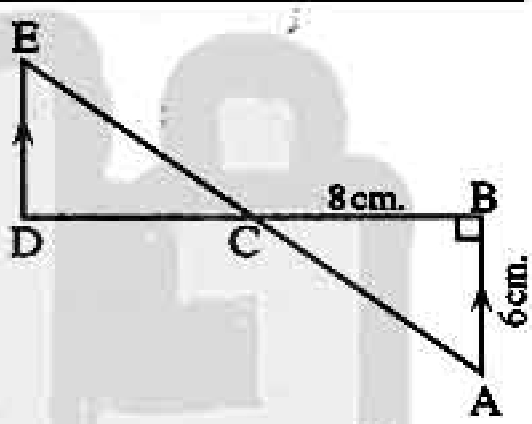
10 **In the opposite figure :**

$\overline{BD} \cap \overline{AE} = \{C\}$, $\overline{AB}$ // $\overline{DE}$

, AB = 6 cm. , BC = 8 cm.

and C is the midpoint of $\overline{BD}$

Calculate the length of : $\overline{CE}$



« 10 cm. »

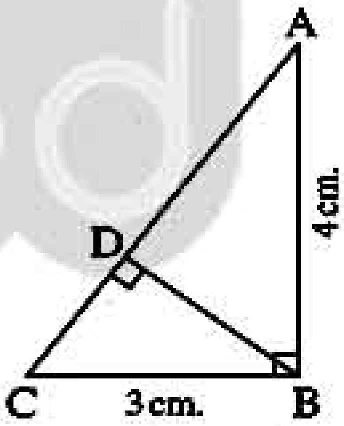
11 **In the opposite figure :**

ABC is a right-angled triangle at B

, $\overline{BD} \perp \overline{AC}$, AB = 4 cm.

and BC = 3 cm.

Calculate the length of : $\overline{BD}$



« 2.4 cm. »

12 **Complete the following :**

- In the right-angled triangle , the area of the square on the hypotenuse equals ....
- If XYZ is a right-angled triangle at X , XY = 12 cm. and XZ = 9 cm. , then YZ = ... cm.
- If ABC is a right-angled triangle at B , AB = 20 cm. and AC = 25 cm. , then BC = ... cm.

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Unit 3

(4) **In the opposite figure :**

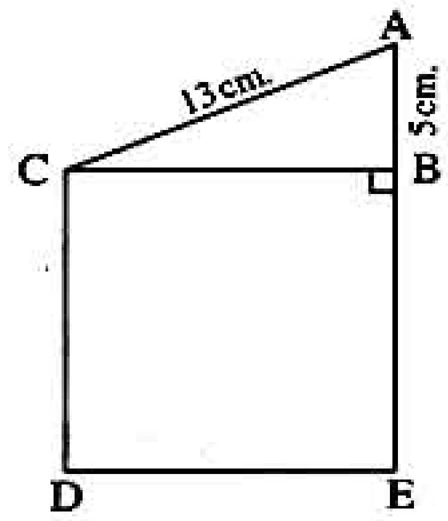
If m (∠ ABC) = 90°

, AB = 5 cm.

and AC = 13 cm.

, then the area of

the square BEDC = ... cm^2.



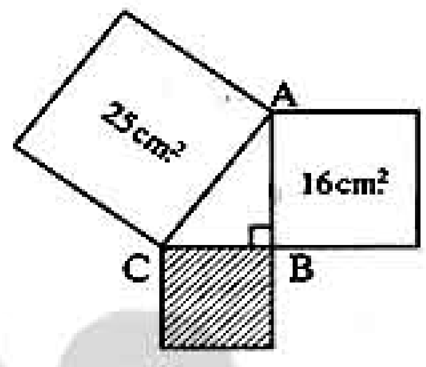
(5) A rectangle is of length 8 cm. and width 6 cm. , then the length of its diagonal equals .... cm.

(6) If the area of a rectangle equals 60 cm^2. and its width is 5 cm. , then the length of its diagonal = ... cm.

(7) If Δ ABC is right-angled at B ,

then the side length of the shaded

square = ... cm.

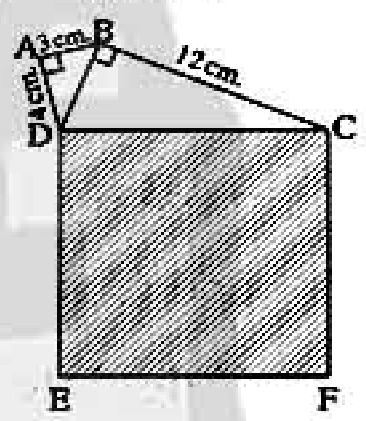


(8) If Δ ABD is right-angled at A

and Δ BCD is right-angled at B ,

then the area of the shaded

square = ... cm^2.



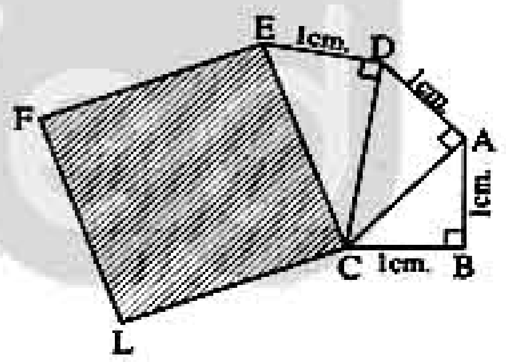
(9) If each of the triangles ABC , ACD and DCE

are right-angled at B , A and D respectively ,

AB = BC = AD = DE = 1 cm.

, then the area of the shaded

square = ... cm^2.



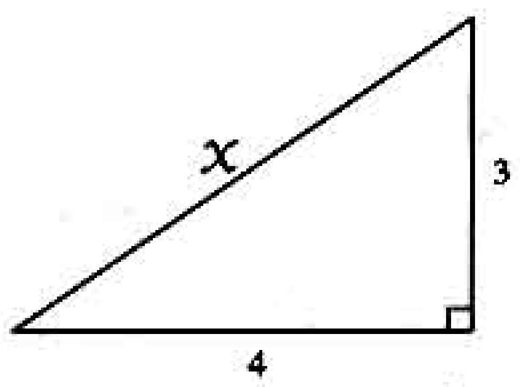
13 Choose the correct answer from those given :

(1) **In the opposite figure :**

Which of the following relations is true ?

(a) $x = 4^2 + 3^2$ (b) $x^2 = 4^2 - 3^3$

(c) $x^2 + 9 = 16$ (d) $x^2 = 25$

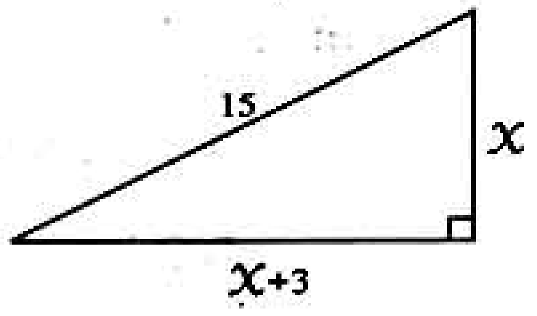


(2) 📖 **In the opposite figure :**

Which of the following relations is true ?

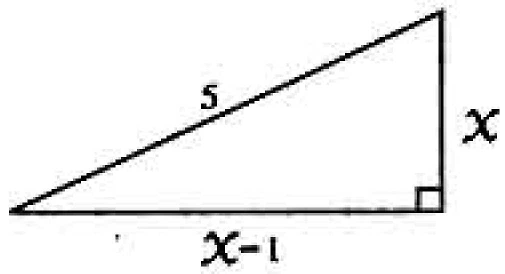
(a) $x + 3 + x = 15$ (b) $x^2 + 3x = 108$

(c) $(x + 3)^2 = 15 - x^2$ (d) $x^2 + 6x + 9 = 225$



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(3) **In the opposite figure :**



Which of the following relations is true ?

(a) $x^2 + (x-1)^2 = 5$ (b) $x + (x-1) = 25$

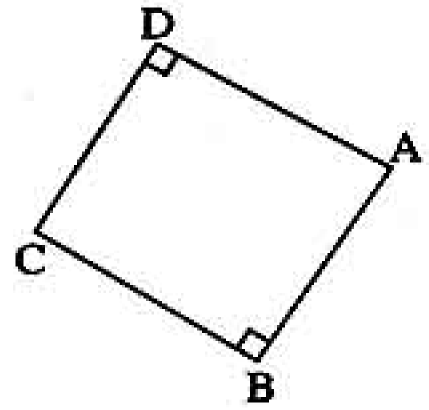
(c) $x^2 - x = 12$ (d) $(x-1)^2 - x^2 = 25$

(4) If ABCD is a square , then $(AC)^2 = \cdots\cdots$

(a) AB (b) $(AB)^2$ (c) $2\,(AB)^2$ (d) $4\,(AB)^2$

---

14 **In the opposite figure :**

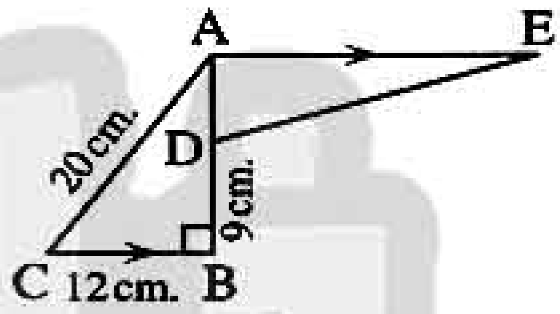


If m (∠ B) = m (∠ D) = 90°

Prove that : $(AB)^2 + (BC)^2 = (AD)^2 + (DC)^2$

---

15 **In the opposite figure :**



ABC is a triangle , m (∠ B) = 90°

, $\overline{AE}$ // $\overline{BC}$, If BC = 12 cm. , AC = 20 cm.

, D ∈ $\overline{AB}$ where BD = 9 cm. and AE = 2 BC

, **find the length of each of :** $\overline{AD}$ and $\overline{ED}$

« 7 cm. , 25 cm. »

Life Applications

16 A window cleaner has a ladder which is 5 metres long.



He places it so that it reaches

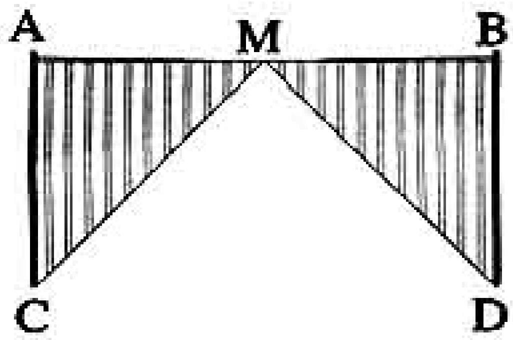
a window sill 4 metres from the ground.

How far is the wall from the foot of the ladder ?

« 3 m. »

---

17 A wooden bridge $\overline{AB}$ of length 15 m. is built horizontally on two vertical walls $\overline{AC}$ and $\overline{BD}$ resting on two supports $\overline{MC}$ and $\overline{MD}$



If AC = 4 m. and AM = MB ,

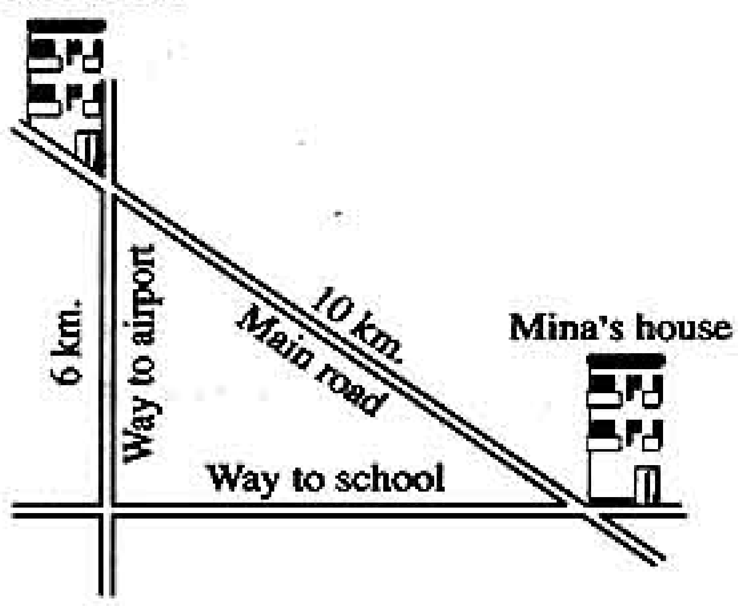
calculate the length of the support $\overline{MC}$

« 8.5 m. »

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18 If Mina wants to go to the house of his friend Bassem.
What is the distance he saves if he takes the main road instead of the other two roads ?

« 4 km. »



For excellent pupils

19 If Δ ABC is right-angled at B , D is the midpoint of $\overline{BC}$,

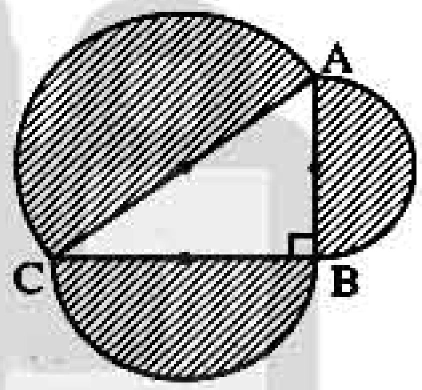
Prove that : $(AC)^2 - (AD)^2 = 3\,(BD)^2$

---

20 **In the opposite figure :**

Prove that the sum of areas of the two semicircles drawn on the two sides of the right angle in a right-angled triangle equals the area of the semicircle drawn on the hypotenuse?

[Given the area of the circle = πr^2]

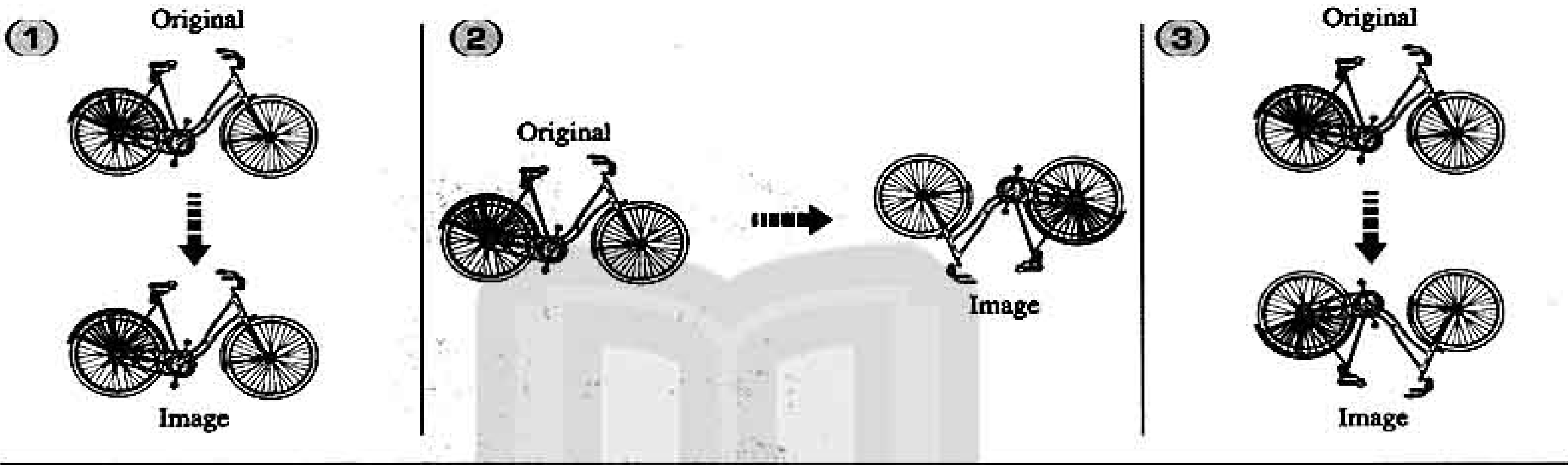


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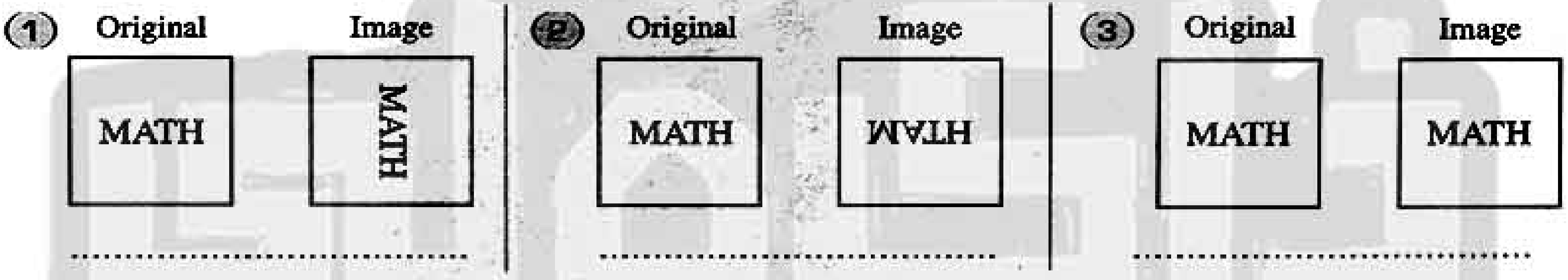
From the school book

Exercise 8 On geometric transformations

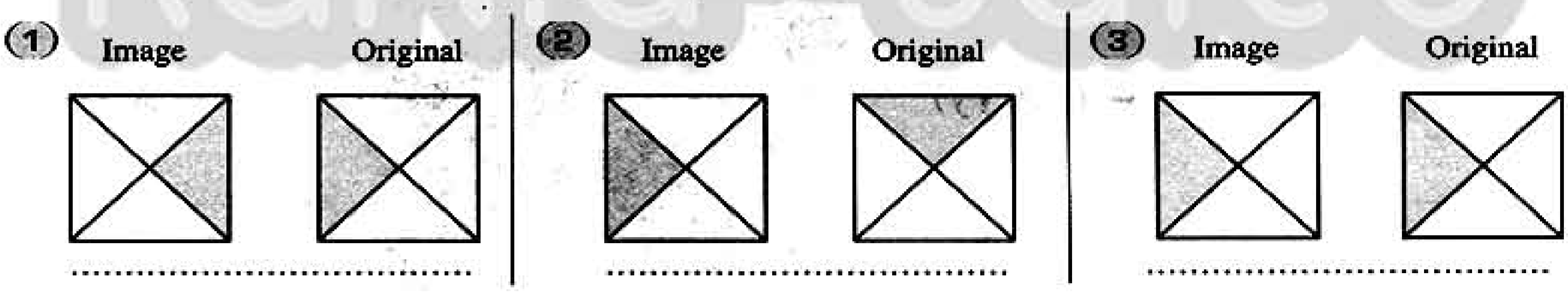
1 Describe the type of the geometric transformation (reflection , translation or rotation) in each of the following :



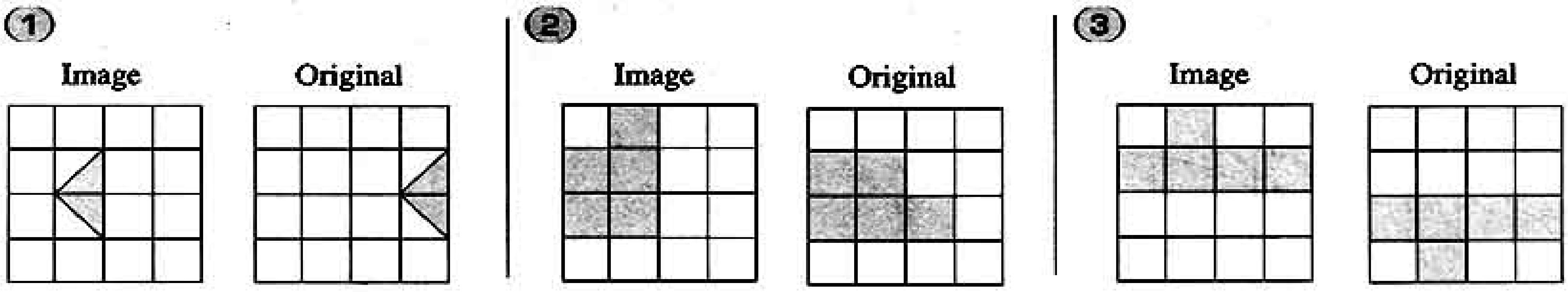
2 Write below each shape the type of the geometric transformation (reflection , translation or rotation) :



3 Write below each shape the type of the geometric transformation (reflection , translation or rotation) :

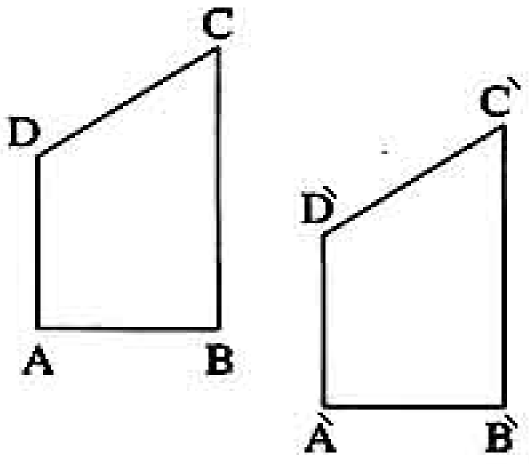


4 Write the type of the geometric transformation in each of the following shapes :

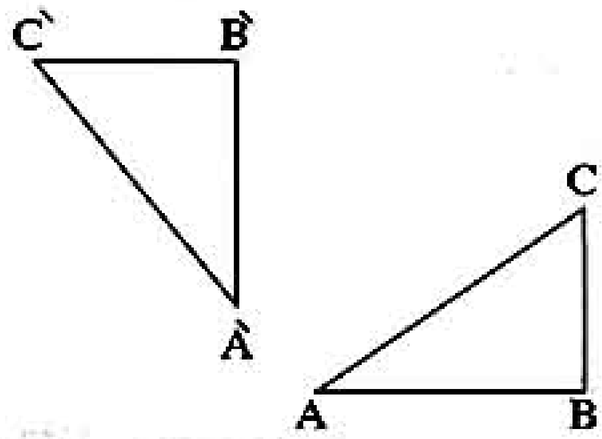


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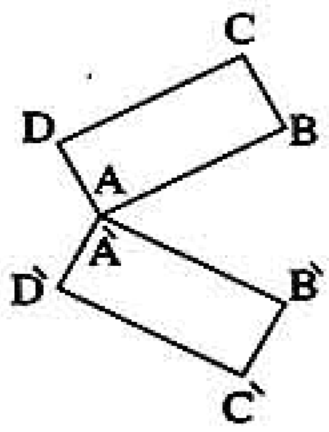
5 Describe the type of transformation in each of the following figures (reflection , translation , rotation) :



(1) ....



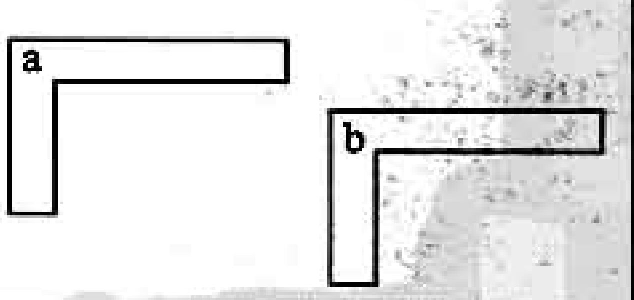
(2) ....



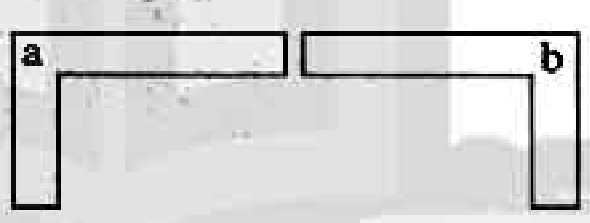
(3) ....

6 Figure b is the image of figure a by a geometric transformation. Identify each transformation as (a translation , a reflection or a rotation) :

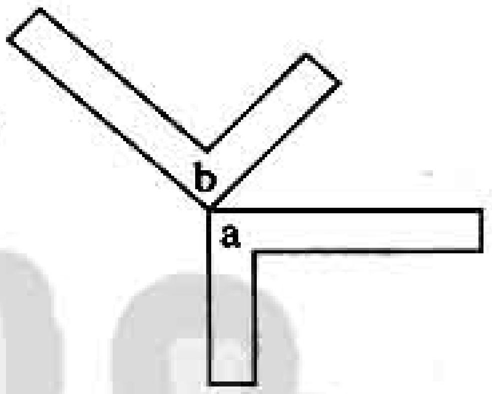
(1)



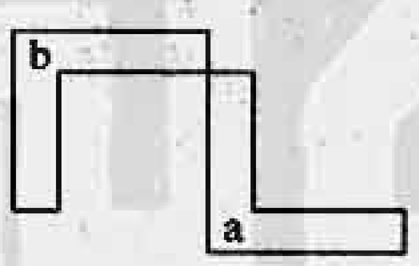
(2)



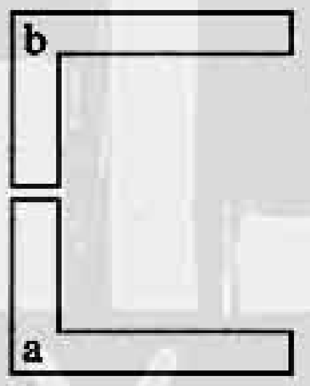
(3)



(4)

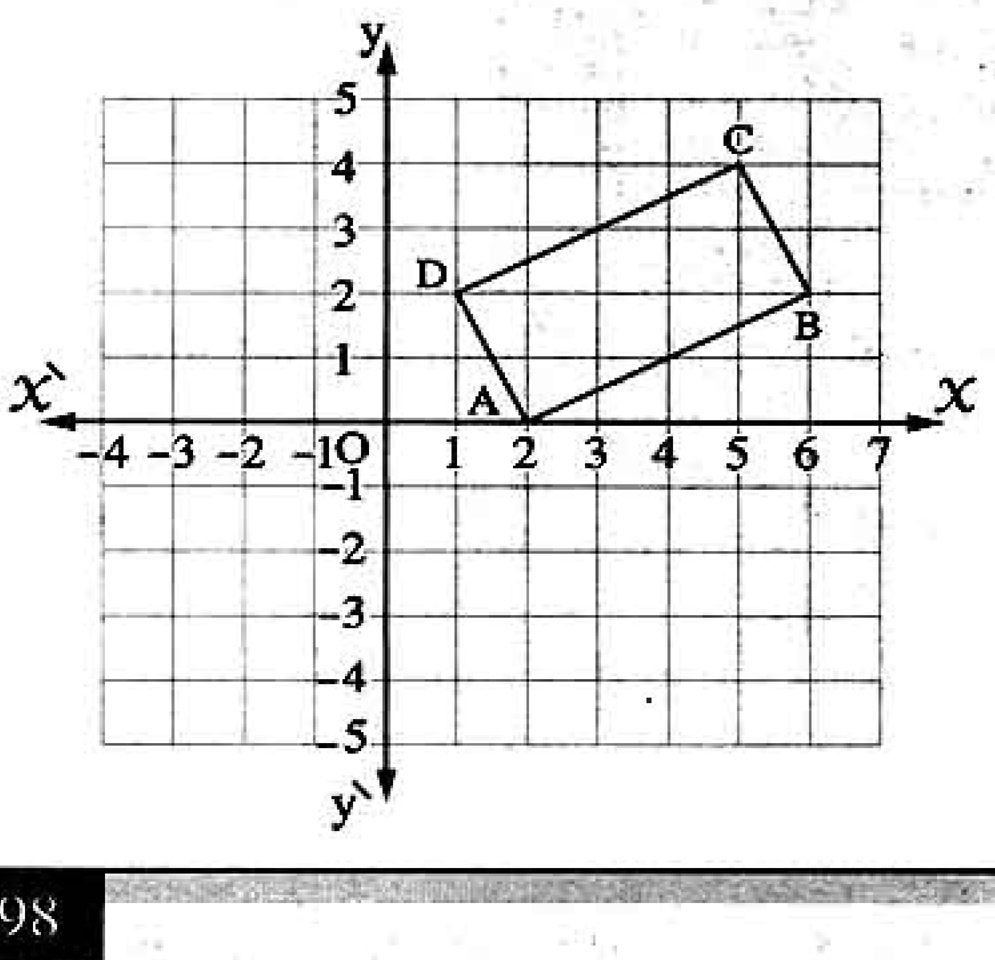


(5)

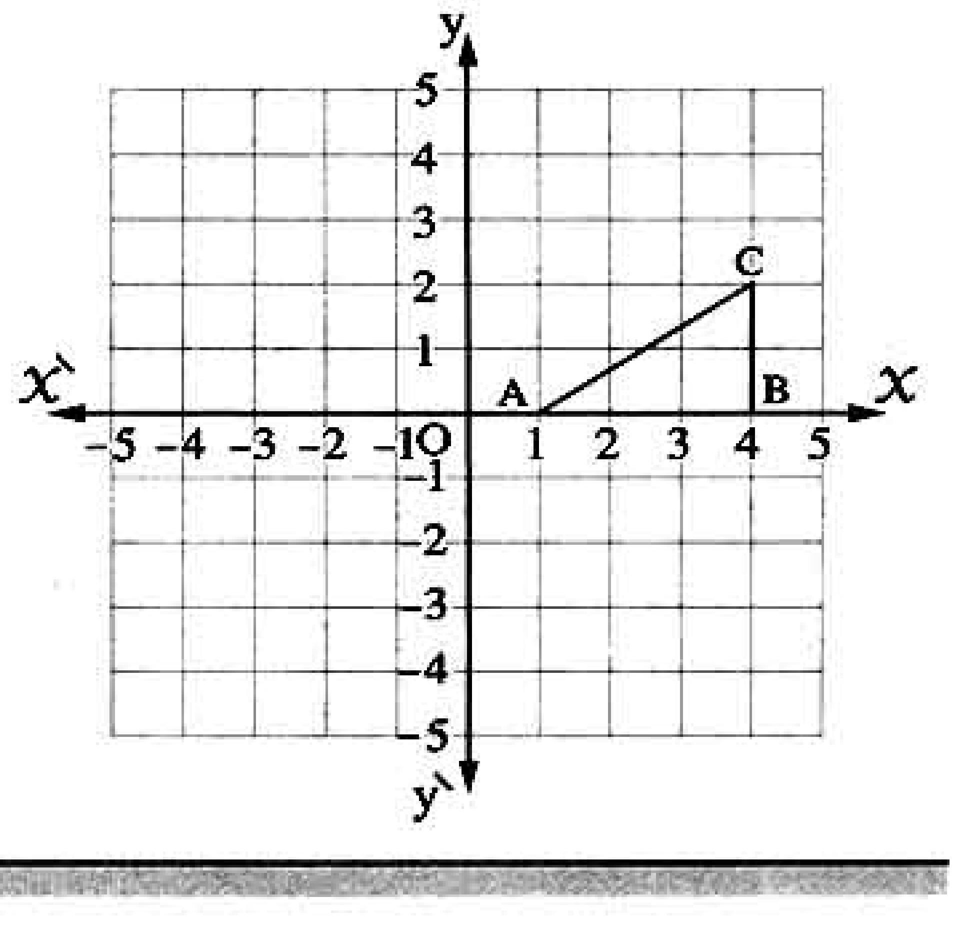


7 Draw the image of each figure according to the shown transformation , then describe each type :

(1) $(x , y) \longrightarrow (-x , y)$

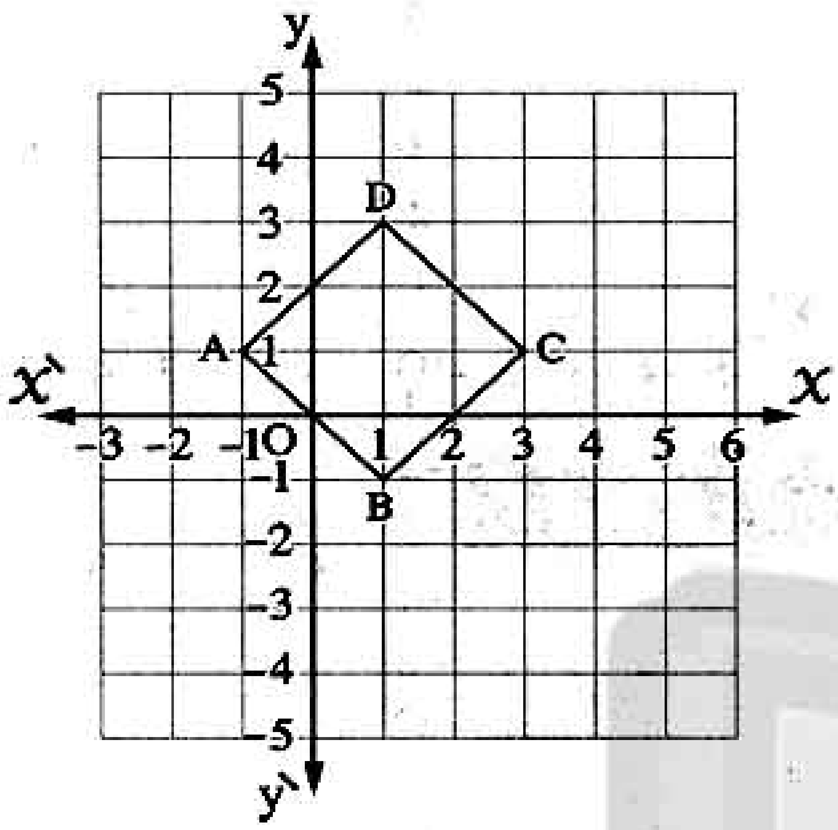


(2) $(x , y) \longrightarrow (-x , -y)$

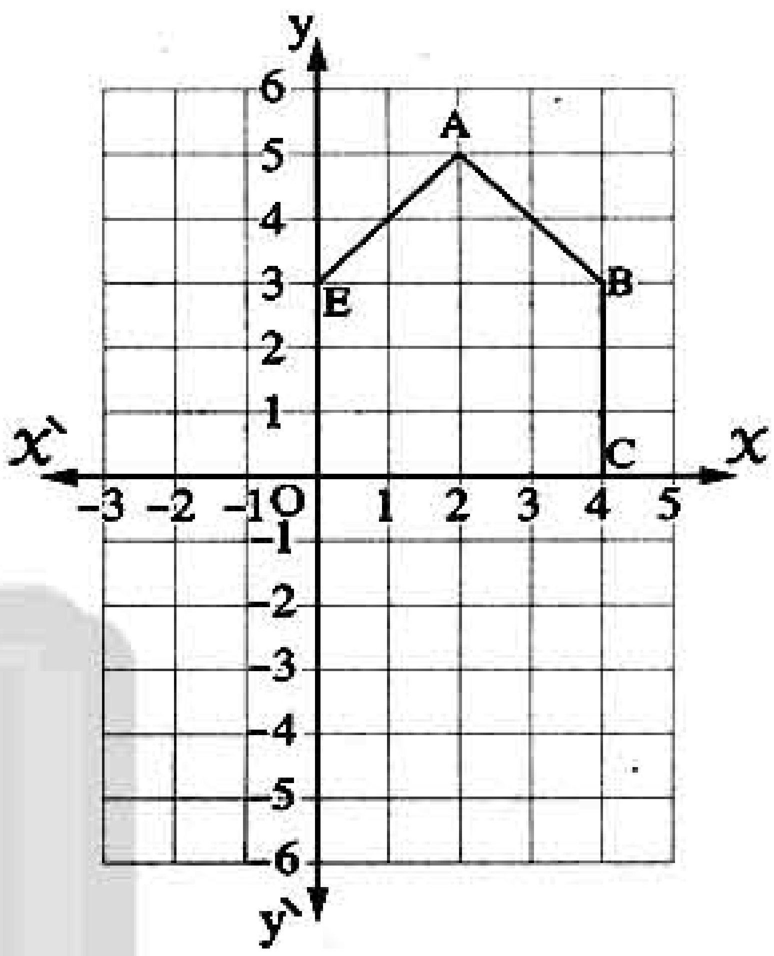


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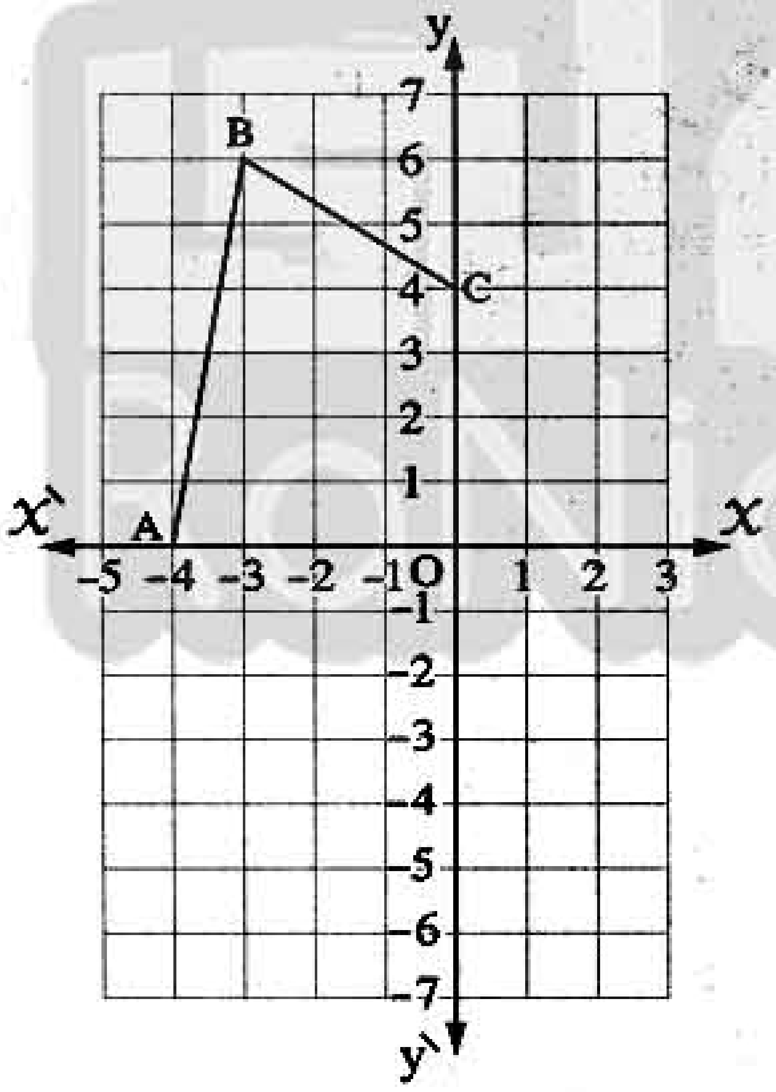
(3) $(x, y) \longrightarrow (x+2, y+3)$



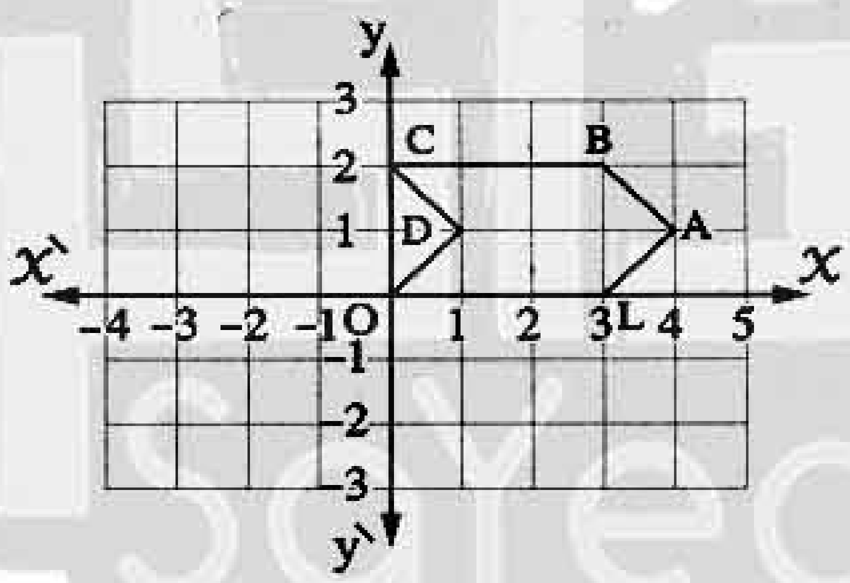
(4) $(x, y) \longrightarrow (x, y-3)$



(5) $(x, y) \longrightarrow (y, -x)$



(6) $(x, y) \longrightarrow (-x, y)$



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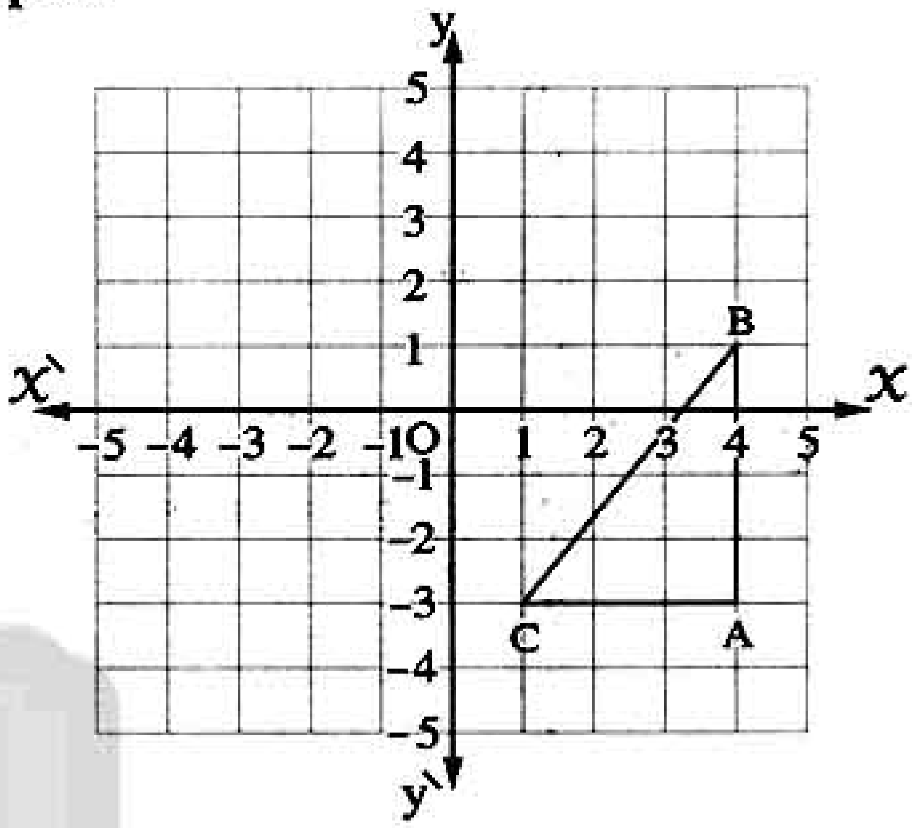
8 Map the image of Δ ABC where A (4 , – 3) , B (4 , 1) , C (1 , – 3) according to the following transformations then describe its type :

(1) $(x , y) \longrightarrow (-x , y)$

(2) $(x , y) \longrightarrow (-x , -y)$

(3) $(x , y) \longrightarrow (x , y - 2)$

(4) $(x , y) \longrightarrow (-y , x)$



9 Draw the image of the polygon ABCDEO according to each transformation and describe the type :

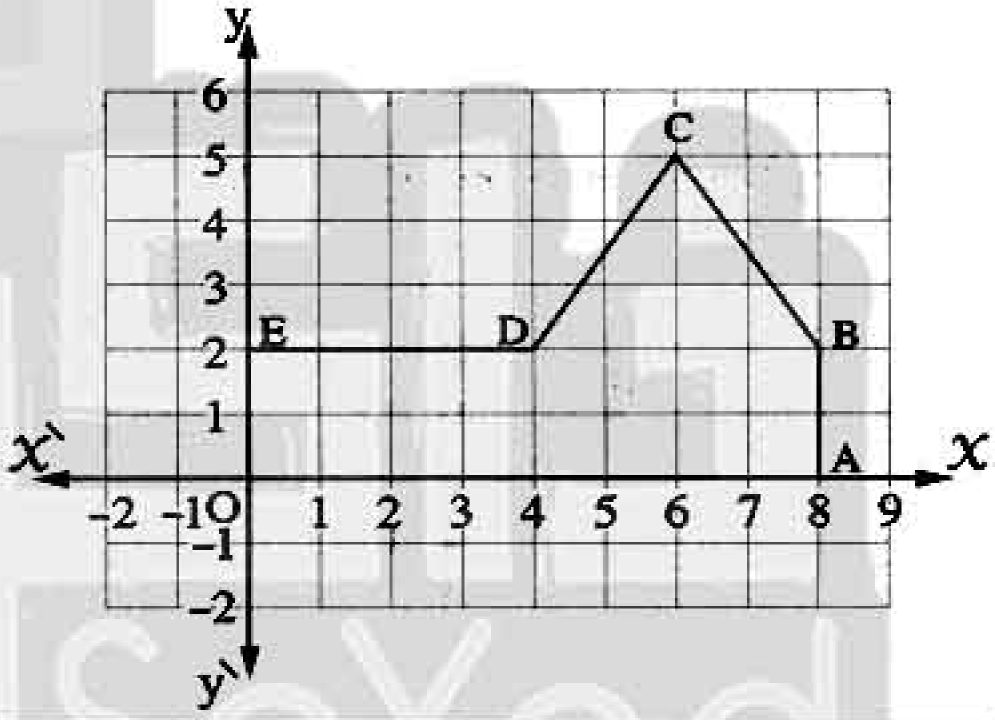
(1) $(x , y) \longrightarrow (-x , y)$

(2) $(x , y) \longrightarrow (x , y + 5)$

(3) $(x , y) \longrightarrow (-x , -y)$

(4) $(x , y) \longrightarrow (x - 5 , y)$

(5) $(x , y) \longrightarrow (x , -y)$



10 Draw the image of Δ ABC where A (1 , 2), B (3 , 2) and C (3 , 5) by the following transformations :

(1) $(x , y) \longrightarrow (x , -y)$

(2) $(x , y) \longrightarrow (x + 1 , y - 3)$

(3) $(x , y) \longrightarrow (-y , x)$

11 On a square lattice, draw Δ ABO where A (3 , 1) , B (1 , 3) and O is the origin point, and draw its images by the following transformations then discribe its type :

(1) $(x , y) \longrightarrow (x + 1 , y - 2)$

(2) $(x , y) \longrightarrow (x , -y)$

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(3) $(x , y) \longrightarrow (-y , x)$

(4) $(x , y) \longrightarrow (-x , -y)$

12 **On a square lattice, draw the quadrilateral ABCD where A (1 , 1), B (4 , 2) , C (3 , 4) and D (1 , 4) , and draw its image by the following transformation, then discribe its type :**

(1) $(x , y) \longrightarrow (y , -x)$

(2) $(x , y) \longrightarrow (-x , y)$

(3) $(x , y) \longrightarrow (x - 1 , y + 1)$

For excellent pupils

13 Draw Δ ABC whose image Δ À B̀ C̀ by the transformation $(x , y) \longrightarrow (-y , x)$ where À (1 , – 1) , B̀ (3 , 1) and C̀ (4 , – 1) , then discribe the transformation type.

RaNia SaYed

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From the school book

Exercise 9 On reflection in a straight line

First Problems on reflection in the plane :

1 Find the image of each of A , $\overline{AB}$ and Δ ABC by reflection in the straight line L :

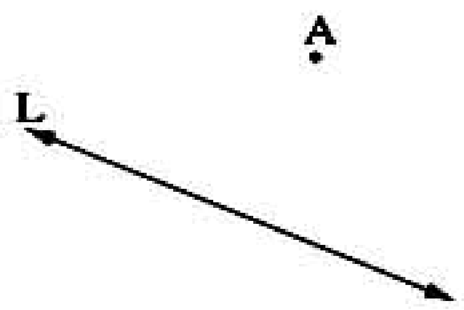


fig. (1)

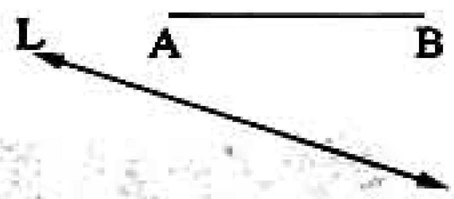


fig. (2)

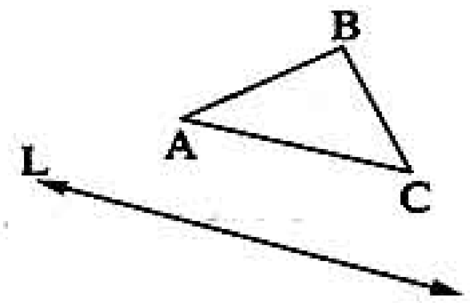
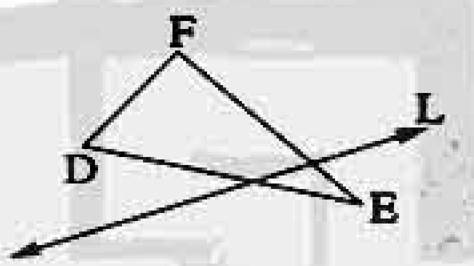
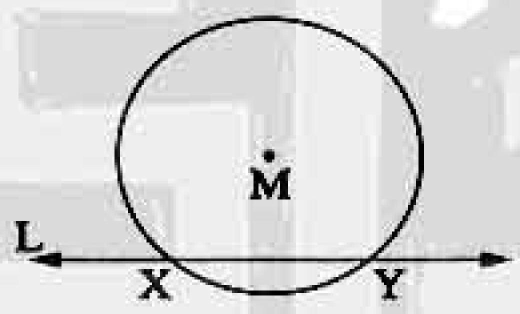


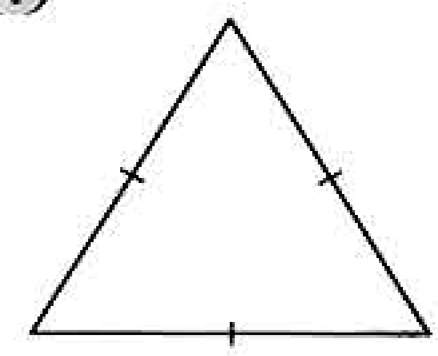
fig. (3)

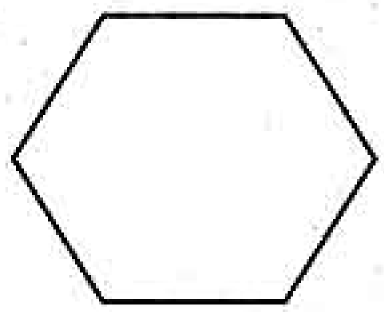
2 Copy the figures below in your notebook , then draw the images of Δ DEF and the circle M by reflection in L :

(1)


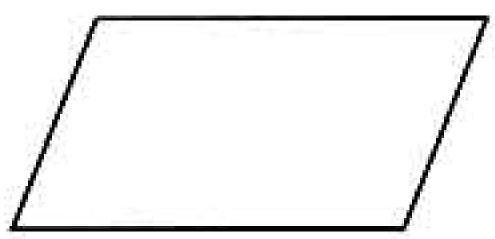
(2)


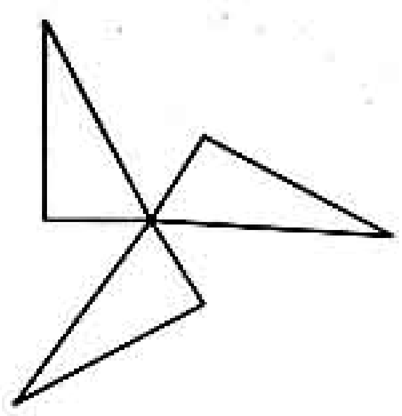
3 Draw the axes of symmetry of each of the following figures if they are existed :

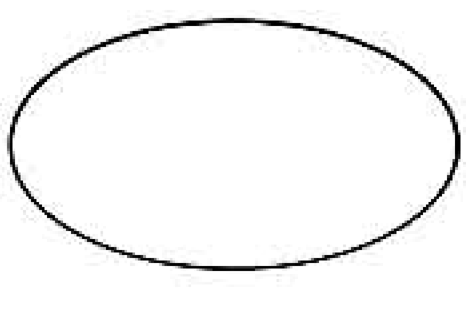
(1)


(2)


(3)


(4)


(5)


(6)


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4 **Draw the triangle ABC in which :** AB = 6 cm. , m (∠ A) = 90° and m (∠ B) = 30°
Then draw its image by reflection in $\overleftrightarrow{AB}$

5 **Draw the image of Δ ABC in which :** AB = 3 cm. , BC = 4 cm. and AC = 5 cm. by reflection in the straight line containing the shortest side.

6 **Draw the image of Δ XYZ in which :** XY = 3 cm. , YZ = 5 cm. and ZX = 7 cm. by reflection in the straight line containing the longest side.

7 **Draw Δ ABC in which :** AB = 3 cm. , BC = 6 cm. and m (∠ ABC) = 90° , then find its image by reflection in the straight line L which is perpendicular to $\overline{BC}$ at C

8 **Draw the rectangle ABCD in which :** AB = 6 cm. and CB = 4 cm. , then draw its image by reflection in $\overleftrightarrow{AD}$. Say the name of the resulting figure which consists of the rectangle and its image , then find its perimeter. « 32 cm. »

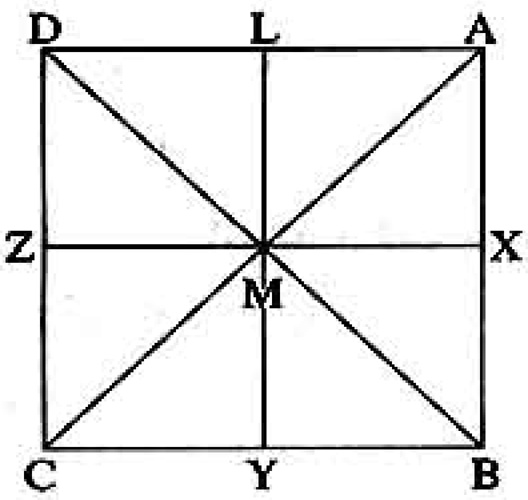
9 Draw the image of the circle M whose radius length is 2 cm. , by reflection in the straight line which is far from the centre by 1 cm.

10 Draw the circle N with radius length 2.5 cm. , then draw its image by reflection in the straight line which is far from its centre by 2.5 cm.

11 Draw Δ ABC where BC = 3 cm. , AB = 4 cm. and AC = 5 cm.
If the point D is the image of the point C by reflection in $\overleftrightarrow{AB}$
Find :
(1) The perimeter of Δ ACD
(2) The area of Δ ACD « 16 cm. , 12 cm^2 »

12 **In the opposite figure :**

ABCD is a square. M is the point of intersection of its diagonals X , Y , Z and L are the midpoints of its sides $\overline{AB}$, $\overline{BC}$, $\overline{CD}$ and $\overline{DA}$ respectively. **Complete the following :**



(1) The image of the point A by reflection in $\overleftrightarrow{LY}$ is ....
(2) The image of the $\overline{AM}$ by reflection in $\overleftrightarrow{XM}$ is ....
(3) The image of the Δ ALM by reflection in $\overleftrightarrow{LY}$ is ....
(4) The image of the Δ ALM by reflection in $\overleftrightarrow{XZ}$ is ....
(5) The image of the Δ ALM by reflection in $\overleftrightarrow{AM}$ is ....

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(6) The image of the Δ AMB by reflection in $\overleftrightarrow{LY}$ is ……….

(7) The image of the Δ AMB by reflection in $\overleftrightarrow{XZ}$ is ……….

(8) The image of the square AXML by reflection in $\overleftrightarrow{LY}$ is ……….
and by reflection in $\overleftrightarrow{AM}$ is ……….

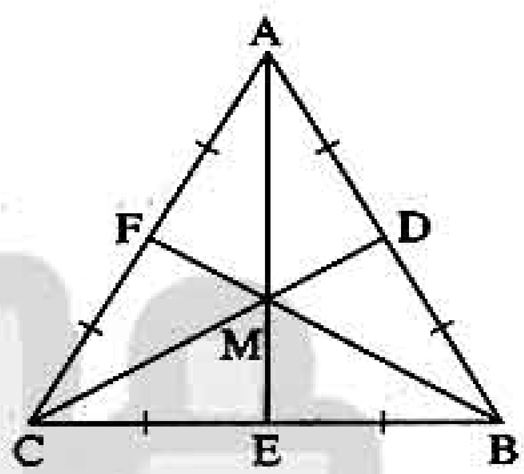
(9) The image of the square ABCD by reflection in $\overleftrightarrow{LY}$ is ……….

(10) Δ MZD is the image of Δ MZC by reflection in ……….

(11) Δ AXM is the image of Δ CYM by reflection in ……….

13 **In the opposite figure :**

Δ ABC is an equilateral triangle , where D , E and F are the midpoints of $\overline{AB}$, $\overline{BC}$ and $\overline{AC}$ respectively , and $\overline{AE} \cap \overline{BF} \cap \overline{CD} = \{M\}$:



Complete :

(1) Axes of symmetry of Δ ABC are ……….

(2) $\overline{AB}$ is the reflected image of $\overline{AC}$ by reflection in ……….

(3) The reflected image of $\overline{AF}$ by reflection in $\overleftrightarrow{BF}$ is ………. ,
and the reflected image of $\overline{CF}$ in $\overleftrightarrow{AE}$ is ……….

(4) The reflected image of Δ AMD by reflection in $\overleftrightarrow{AE}$ is ……….
∴ m (∠ AMD) = m (∠ ……….) , because reflection in a line reserves ……….

(5) The reflected image of Δ AMB by reflection in $\overleftrightarrow{AE}$ is ……….

(6) Δ BMC is the reflected image of ………. by reflection in $\overleftrightarrow{CD}$, and the reflected image of ………. by reflection in $\overleftrightarrow{BF}$
∴ BM = AM , and CM = AM , because the reflection reserves ……….

14 **Complete the following :**

(1) The reflection in a plane reserves :
(a) ………. (b) ………. (c) ………. (d) ……….

(2) If the reflection in a straight line transforms the figure to itself then this straight line is called ……….

(3) The number of axes of symmetry of :

(a) The equilateral triangle is ……….	(b) The isosceles triangle is ……….
(c) The scalene triangle is ……….	(d) The parallelogram is ……….
(e) The rectangle is ……….	(f) The rhombus is ……….
(g) The square is ……….	(h) The trapezium which is not isosceles is ……….
(i) The isosceles trapezium ……….	(j) The circle ……….

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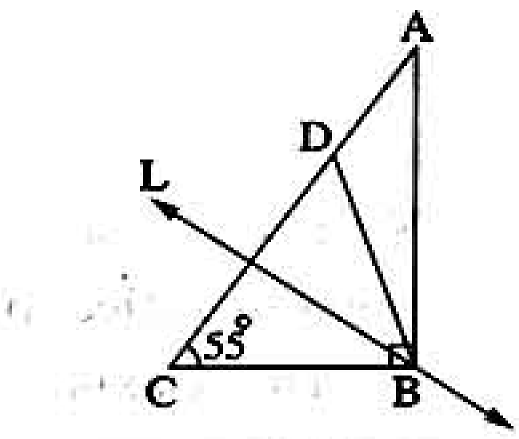
⑭ In the opposite figure :

If m (∠ ABC) = 90°

and m (∠ C) = 55° , the straight line L

is the axis of symmetry of Δ DBC

, then m (∠ ABD) = ……… °



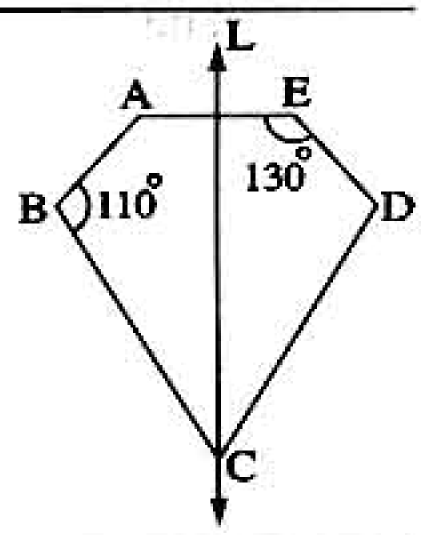
15 In the opposite figure :

If the straight line L

is the axis of symmetry

of the figure ABCDE ,

calculate : m (∠ BCD)



« 60° »

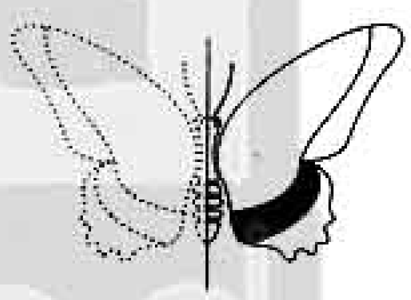
16 📖 By using geometric instruments , draw the rectangle ABCD , where AB = 3 cm. and BC = 4 cm. locate $\grave{A}$ as the reflected image of A by reflection in $\overleftrightarrow{CD}$ and locate $\grave{C}$ as the reflected image of C by reflection in $\overleftrightarrow{AB}$

Prove that :

(1) m (∠ $\grave{C}$AC) = 2 m (∠ CAB) (2) $\overleftrightarrow{AC}$ // $\overleftrightarrow{\grave{A}\grave{C}}$

Life Applications

17 By using the reflection we can complete drawing some of the symmetrical shapes like the butterfly in the opposite figure.



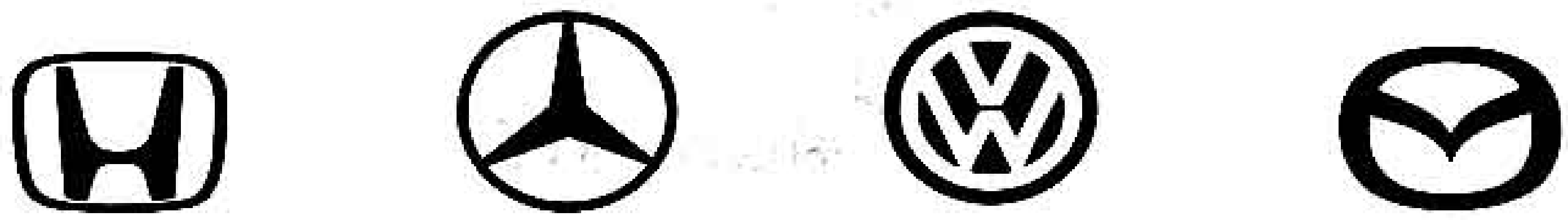
Use the reflection to complete each of the following figures :



18 In our daily life , we see many figures having one or more axes of symmetry in front of you , there are some signs of cars. Draw their axes of symmetry if they exist :



(1) (2) (3) (4)



(5) (6) (7) (8)

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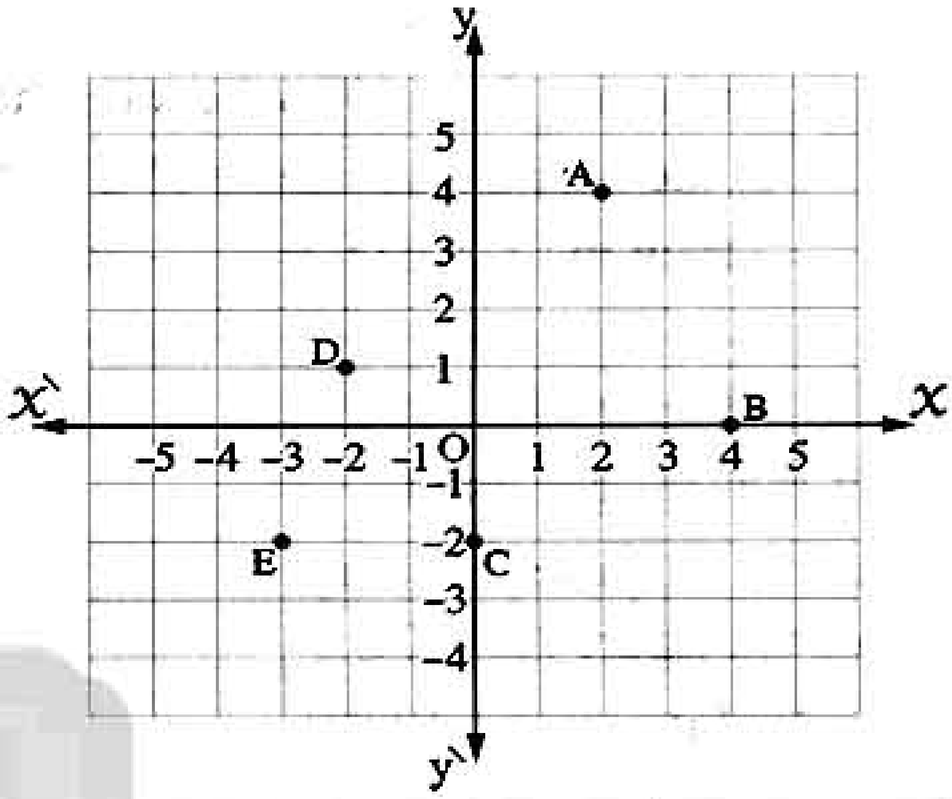
Second | Problems on reflection in the Cartesian plane :

1 In the opposite figure :

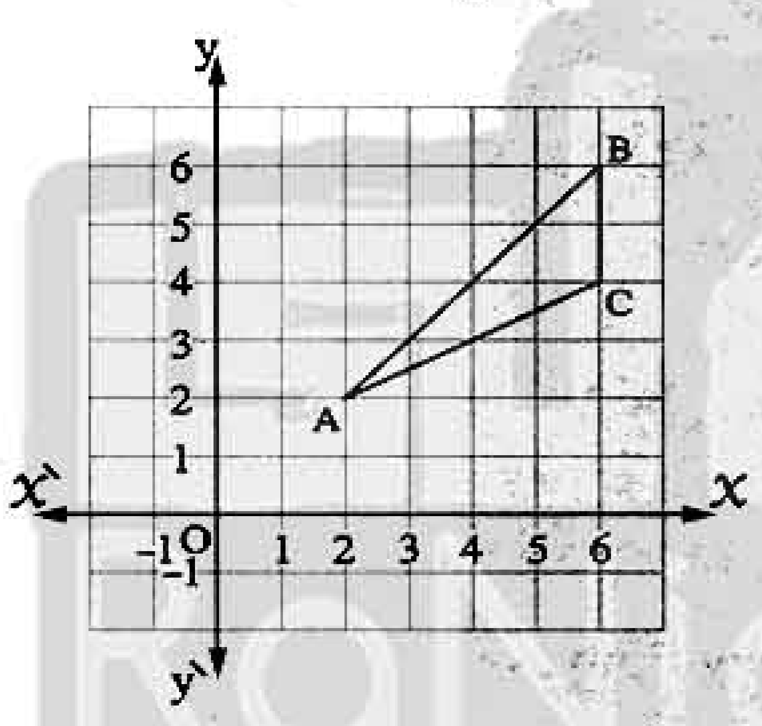
Write the coordinates of the image of each point by reflection in :

(1) The x-axis

(2) The y-axis

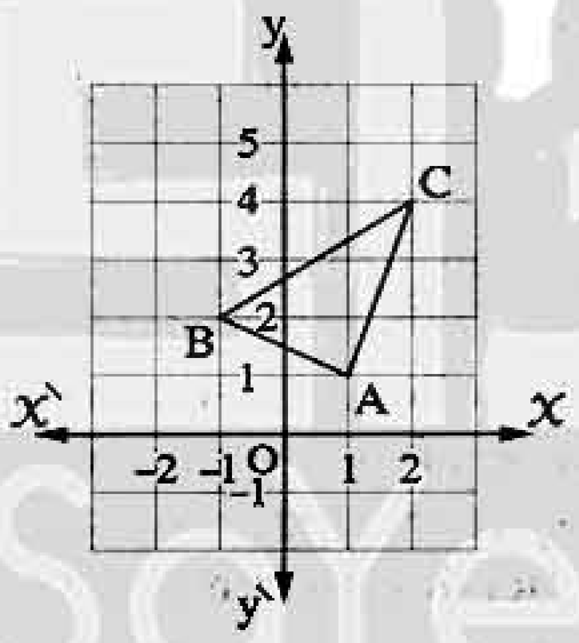


2 Copy each of the following figures on a lattice and draw the images of the figure by a geometric transformation as shown below each figure , then write the coordinates of each vertex of the figure.



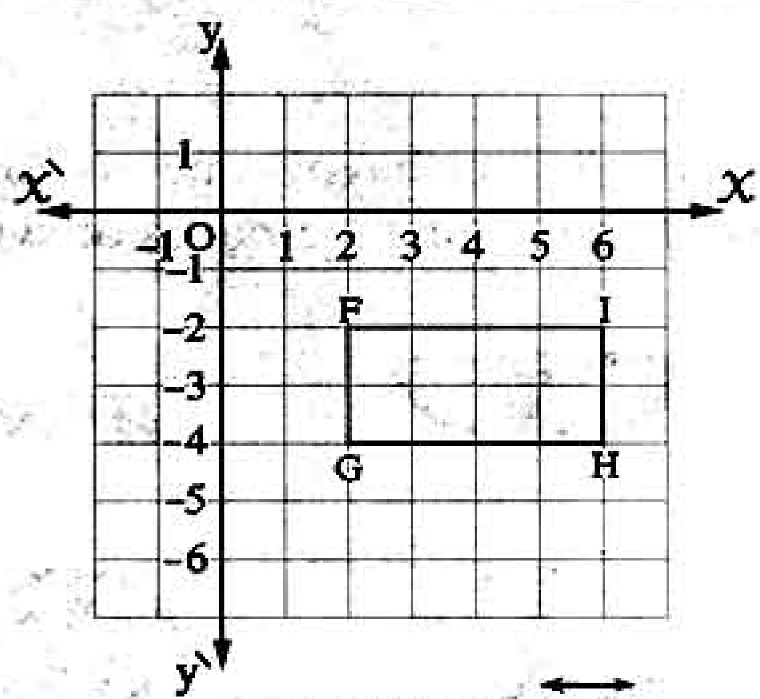
reflection in the x-axis

fig. (1)



reflection in the y-axis

fig. (2)



reflection in $\overleftrightarrow{FG}$

fig. (3)

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3 Draw $\overline{AB}$ where A (4 , 3) and B (1 , – 2) , then draw its image by reflection in :

(1) The X-axis (2) The y-axis

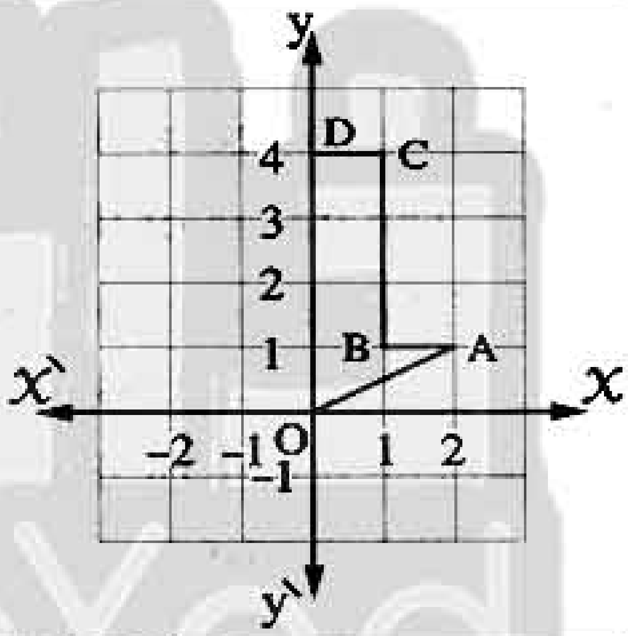
4 If A (3 , 1) and B (3 , – 2) , find $\overline{DC}$ which is the image of $\overline{AB}$ by reflection in the y-axis and name the figure ABCD and calculate its perimeter. « 18 length units »

5 Find the image of Δ ABC where A (– 6 , – 1) , B (– 2 , – 1) and C (– 5 , – 6) by reflection in the X-axis

6 Draw the image of Δ ABC where A (0 , 0) , B (3 , 0) and C (– 1 , 2) by reflection in the y-axis

7 On a square lattice , draw Δ ABC where A (2 , – 2) , B (3 , 4) and C (– 3 , 2) then draw Δ ÀB̀C̀ which is the image of Δ ABC by reflection in the y-axis then draw Δ A̤B̤C̤ which is the image of Δ ÀB̀C̀ by reflection in the X-axis

8 Draw the image of the opposite figure by reflection in the X-axis and in the y-axis another time.



9 On a square lattice , draw the rectangle whose vertices are A (3 , 2) , B (8 , 2) , C (8 , 6) and D (3 , 6) , then draw its image by reflection in the y-axis

10 **Graph the square ABCD and its image :** by reflection in the X-axis , then compare the length of the sides and the area where A (0 , 2) , B (– 5 , 0) , C (– 3 , – 5) and D (2 , – 3)

11 ABCD is a rectangle in which : A (1 , 1) , B (1 , 3) and C (– 3 , 3) Determine the coordinates of D from the graph , then find the image of the rectangle ABCD by reflection in the X-axis.

12 Draw the image of the square ABCD where A (2 , 3) and B (2 , – 1) by reflection in the y-axis. What do you notice ?

13 Draw the image of the rectangle XYZL where X (2 , 2) and Y (– 3 , 2) with width 3 units by reflection in the X-axis.

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14 Complete the following table :

No.	The point	Its image by reflection in the X-axis	Its image by reflection in the y-axis
1	(3 , – 2)		....
2		(1 , 2)	....
3			(– 2 , 4)
4	(0 , 5)		....
5		(3 , 0)	....
6			(0 , 0)

15 Complete the following :

(1) The image of the point (1 , 3) by reflection in the X-axis is ....

(2) The image of the point (– 2 , 5) by reflection in the y-axis ....

(3) The image of the point (2 , – 3) by reflection in the .... is (2 , 3)

(4) The image of the point (– 1 , – 4) by reflection in the .... is (1 , – 4)

(5) The image of the point (0 , 3) by reflection in the .... is itself.

(6) The image of the point (– 5 , 0) by reflection in the .... is itself.

(7) The image of the point (2 , 1) by reflection in the X-axis followed by reflection in the y-axis is ....

(8) The image of the point (2 , – 3) by reflection in the y-axis followed by reflection in the X-axis is ....

(9) If À (– 2 , 3) is the image of the point A (2 , 3) by reflection in y-axis , then the image of the point À by reflection in the y-axis is ....

For excellent pupils

16 Determine on a square lattice the points A (5 , 4) , B (5 , 1) , C (2 , 1) , À (4 , 5) , B̀ (1 , 5) and C̀ (1 , 2)

(1) If Δ ÀB̀C̀ is the image of Δ ABC by reflection in the straight line L , draw this straight line.

(2) If the figure ABB̀À is the image of the figure CBB̀C̀ by reflection in the straight line M , draw this straight line.

17 If the geometric transformation (X , y) ⟶ (y , X) is a reflection in a straight line L , draw on a square lattice the straight line L

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From the school book

Exercise 10 On reflection in a point

First Problems on reflection in the plane :

1 Choose the correct answer from the given ones :

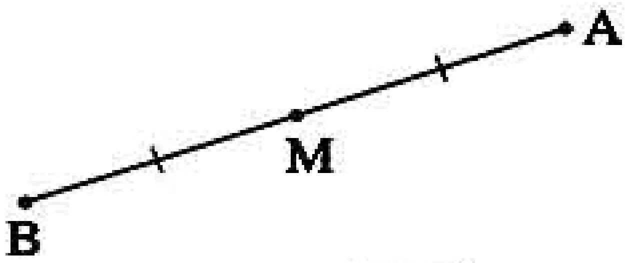
(1) If $\overline{A'B'}$ is the image of $\overline{AB}$ by reflection in M , then $A'B'$ .... AB

(a) > (b) < (c) = (d) ≠

(2) **In the opposite figure :**

The image of $\overline{AB}$

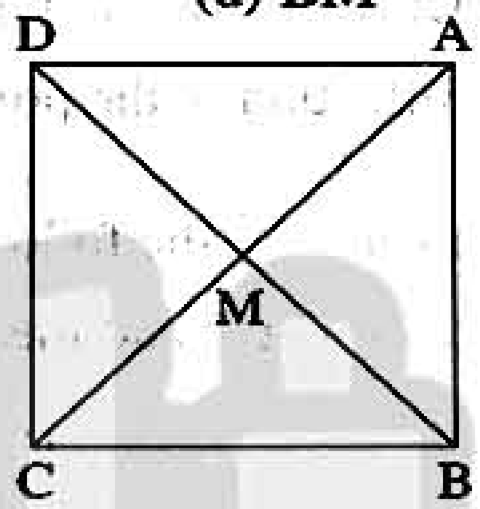
by reflection in the point M is ....



(a) $\overline{AM}$ (b) $\overline{AB}$ (c) $\overline{BA}$ (d) $\overline{BM}$

(3) **In the opposite figure :**

ABCD is a square whose diagonals intersect at M The image of Δ ABM by reflection in M is Δ ....



(a) ADM (b) BCM

(c) DCM (d) CDM

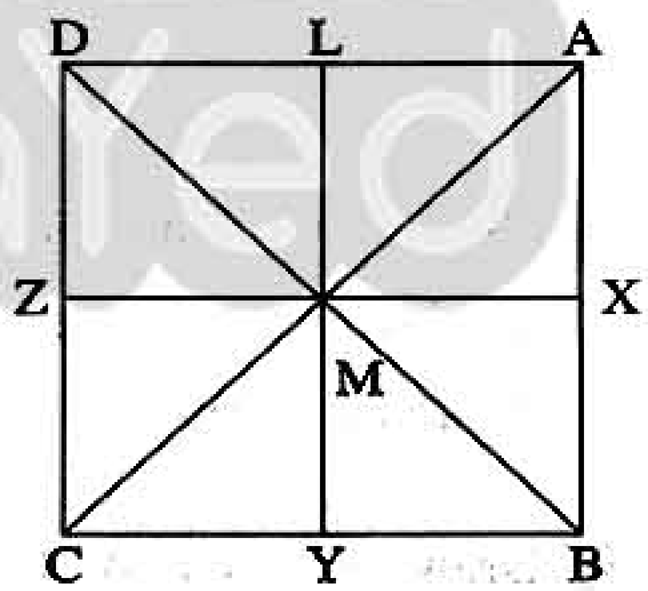
(4) If A' is the image of A by reflection in M and if MA = 5 cm. , then AA' = ...

(a) 5 cm. (b) 7 cm. (c) 10 cm. (d) 15 cm.

2 In the opposite figure :

ABCD is a square whose diagonals intersect at M

X , Y , Z and L are the midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{CD}$ and $\overline{DA}$ respectively



Complete the following :

(1) The image of the point A by reflection in M is ....

(2) The image of the point X by reflection in M is ....

(3) The image of $\overline{AL}$ by reflection in M is ....

(4) The image of $\overline{MZ}$ by reflection in M is ....

(5) The image of $\overline{BM}$ by reflection in M is ....

(6) The image of $\overline{AX}$ by reflection in X is ....

(7) The image of Δ ALM by reflection in M is ....

(8) The image of Δ BXM by reflection in M is ....

(9) The image of Δ AMB by reflection in M is ....

(10) The image of the square AXML by reflection in M is ....

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Unit 3

3 Using the geometric tools , draw the image of each of the following by reflection in A (Answer in the same page of the book) :

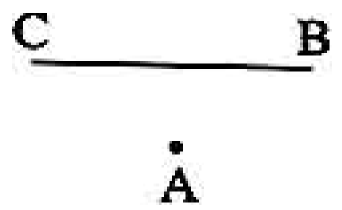


Fig. (1)

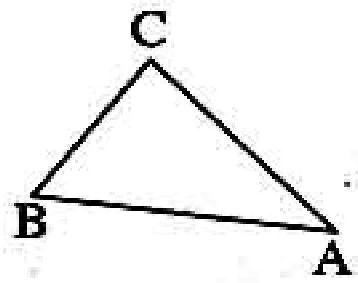


Fig. (2)

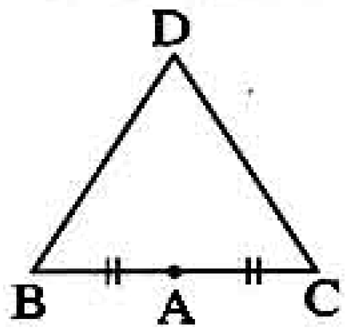


Fig. (3)

4 Draw Δ ABC in which AB = BC = 4 cm. and AC = 5 cm. , then find its image by reflection in the point B

5 In each of the following figures, draw Δ A'BC' as the image of Δ ABC by reflection in the point B and mention the name of the figure A C' A' C giving reason.

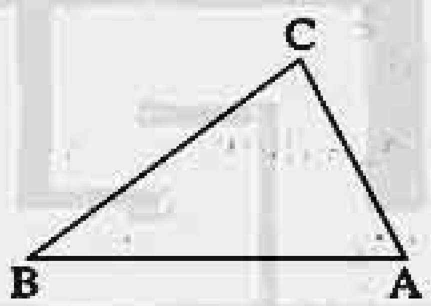


Fig. (1)

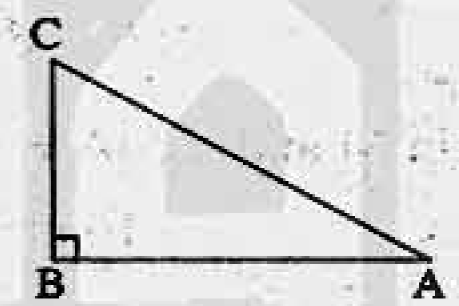


Fig. (2)

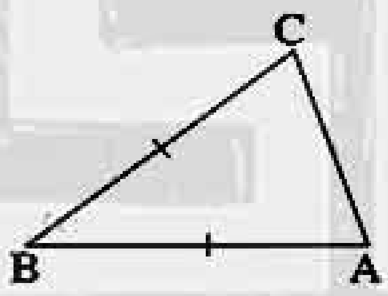


Fig. (3)

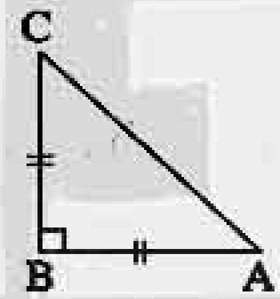


Fig. (4)

6 Draw Δ ABC in which BC = 3 cm. , AB = 4 cm. and m (∠ B) = 90° , then draw Δ A'B'C as the image of Δ ABC by reflection in C Prove that the quadrilateral ABA'B' is a parallelogram.

7 Draw the square ABCD whose side length is 5 cm. then draw its image by reflection in the point M where M is the point of intersection of its diagonals. What do you observe ?

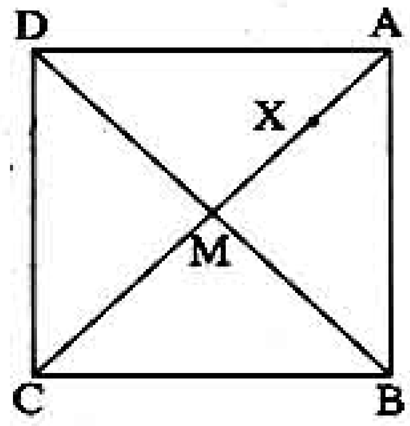
8 ABC is a triangle , F is the midpoint of $\overline{AC}$ Draw D as the image of B by reflection in F What is the type of the figure ABCD and what is the type of the triangle ABC required to transfer the figure ABCD to ....

(1) rectangle. (2) rhombus.

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9 In the opposite figure :

ABCD is a square , M is the point of intersection of its diagonals and $X \in \overline{AM}$ Find Y as the image of X by reflection in M then,

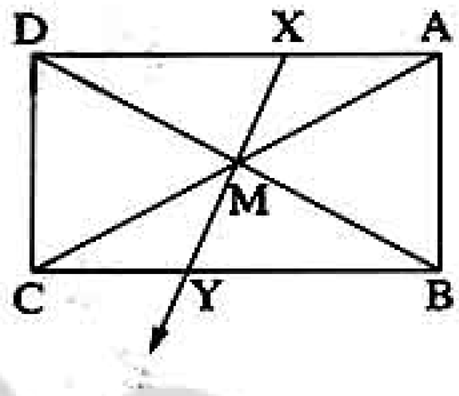


Prove that : (1) Δ DAX $\equiv$ Δ BCY

(2) The figure DXBY is a parallelogram.

10 In the opposite figure :

ABCD is a rectangle , M is the point of intersection of its diagonals , $X \in \overline{AD}$ and $\overrightarrow{XM} \cap \overline{BC} = \{Y\}$



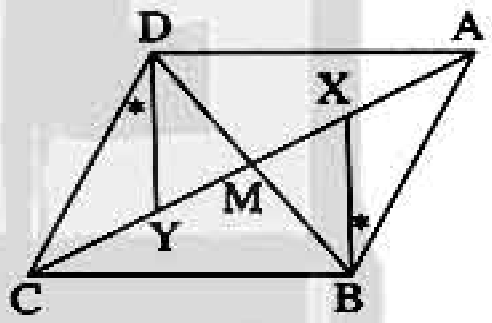
Prove that :

(1) Y is the reflected image of X in M

(2) The figure AXCY is a parallelogram.

11 In the opposite figure :

ABCD is a parallelogram , M is the point of intersection of its diagonals and $X \in \overline{AC}$, $Y \in \overline{AC}$ such that m ($\angle$ ABX) = m ($\angle$ CDY)



Prove that :

(1) Δ ABX is the image of Δ CDY by reflection in M

(2) The figure XBYD is a parallelogram.

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Life Application

12 In front of you , an English letter. Check that if we find the image of this letter by reflection in the midpoint of the inclined line of the letter , then we get the same letter. And we notice that we will see the same figure if we look at it from above or down , right or left. Which of the following figures has the same property ?

N

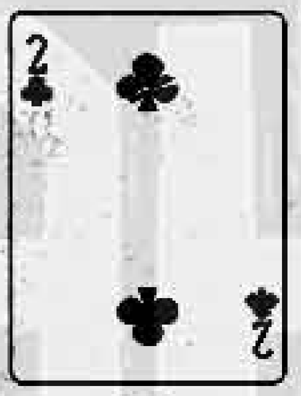
Enrich information

This point is called "point of symmetry"

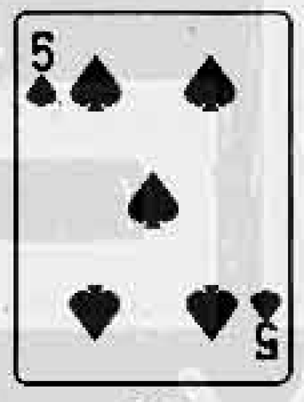
M	I	H	E	A
(1)	(2)	(3)	(4)	(5)
Z	X	W	T	S
(6)	(7)	(8)	(9)	(10)



(11)



(12)



(13)

Second Problems on reflection in the Cartesian plane :

1 **Choose the correct answer from those given :**

(1) The image of the point $(-3, 2)$ by reflection in the origin point is ....

(a) $(3, 2)$ (b) $(-3, -2)$ (c) $(3, -2)$ (d) $(-3, 2)$

(2) The point $(5, -2)$ is the image of the point .... by reflection in the origin point.

(a) $(5, -2)$ (b) $(-5, -2)$ (c) $(-5, 2)$ (d) $(5, 2)$

(3) The point whose image by reflection in the origin point is itself is ....

(a) $(0, 1)$ (b) $(1, 0)$ (c) $(0, 0)$ (d) $(-1, 0)$

(4) The image of the point $(3, -2)$ by reflection in the origin point followed by reflection in X-axis is ....

(a) $(3, -2)$ (b) $(-3, -2)$ (c) $(-3, 2)$ (d) $(3, 2)$

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2 On a square lattice , draw Δ ABC where A (3 , 1) , B (1 , 4) and C (0 , 0) , then find its image by reflection in the point C

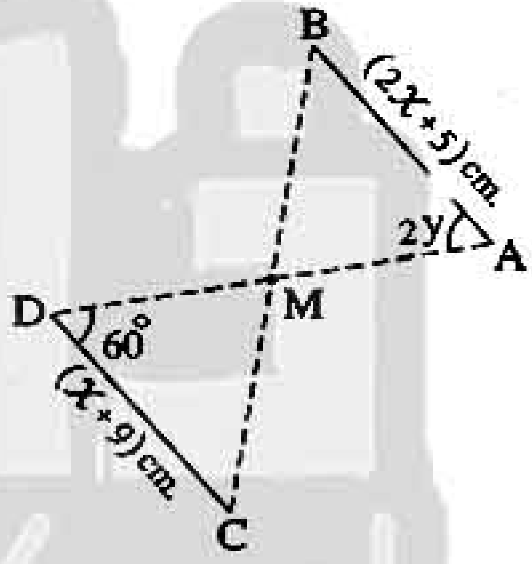
3 In $\mathcal{X}$y - coordinate plane , draw Δ ABC, where : A (– 2 , 4) , B (5 , 0) and C (3 , – 3) , then find the reflected image of Δ ABC in the origin point.

4 On a square lattice , draw Δ ABC where A (2 , – 2) , B (3 , 4) and C (– 3 , 2) , then map Δ ÀB̀C̀ as the image of Δ ABC by reflection in y-axis then map Δ ÀB̀C̀ as the image of Δ ÀB̀C̀ by reflection in $\mathcal{X}$-axis. What is the image of Δ ABC by reflection in the origin point ? What do you deduce ?

5 ABCD is a rectangle where A (2 , 5) , B (6 , 5) , C (6 , 8) and D (2 , 8) , then find the image of the rectangle ABCD by reflection in the origin point.

For excellent pupils

6 **In the opposite figure :**



If $\overline{CD}$ is the image of $\overline{BA}$ by reflection in the point M and BA = (2 $\mathcal{X}$ + 5) cm. , CD = ($\mathcal{X}$ + 9) cm. , m (∠ A) = 2 y and m (∠ D) = 60°

Find : (1) The length of $\overline{CD}$

(2) The value of y « 13 cm. , 30° »

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From the school book

Exercise 11 On translation

First Problems on translation in the plane :

1 **Using the geometric tools , draw the image of each of the following :**

By translation MN in the direction of $\overrightarrow{MN}$ as shown in each case.

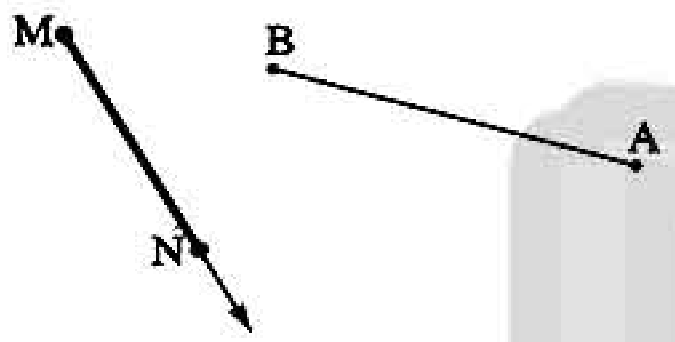


fig. (1)

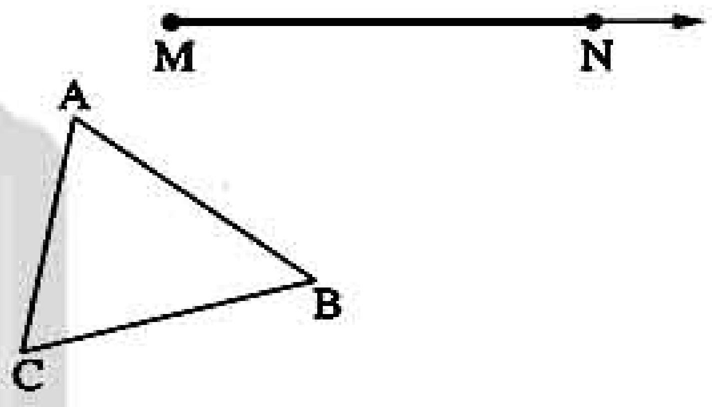
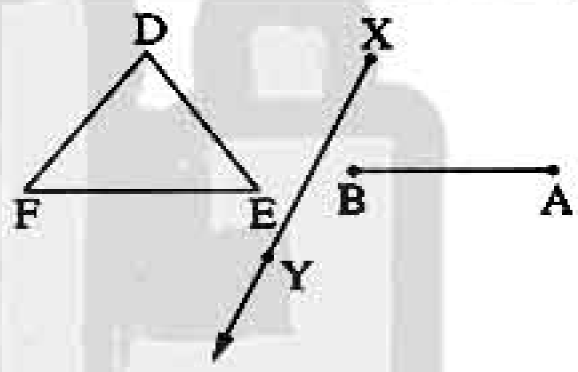


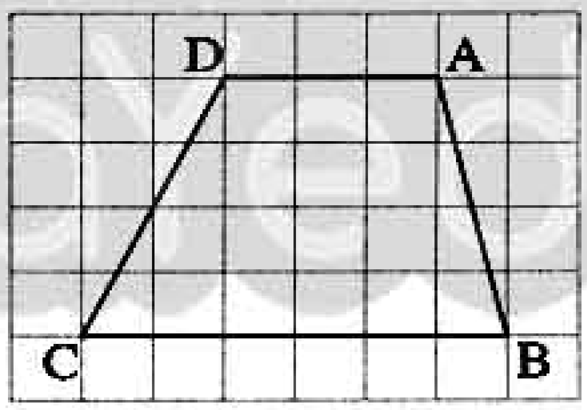
fig. (2)

2 **In the opposite figure :**

Using the geometric tools , find the image of the following figures by the translation of displacement XY in the direction of $\overrightarrow{XY}$



3 Using the grid , draw the image of the figure ABCD by the translation of 4 units in the direction of $\overrightarrow{BC}$



4 Draw a line segment $\overline{AB}$ where AB = 5 cm. , then draw the image of $\overline{AB}$ by a translation of magnitude of 8 cm. in the direction of $\overrightarrow{AB}$

5 Using the geometric instruments , draw the square ABCD whose side length is 4 cm. , then draw its image by translation of magnitude of 4 cm. in the direction of $\overrightarrow{AB}$

6 Draw Δ ABC in which AB = 4 cm. , BC = 6 cm. and CA = 5 cm. , then draw the image of Δ ABC by a translation of magnitude of 3 cm. in the direction of $\overrightarrow{CB}$

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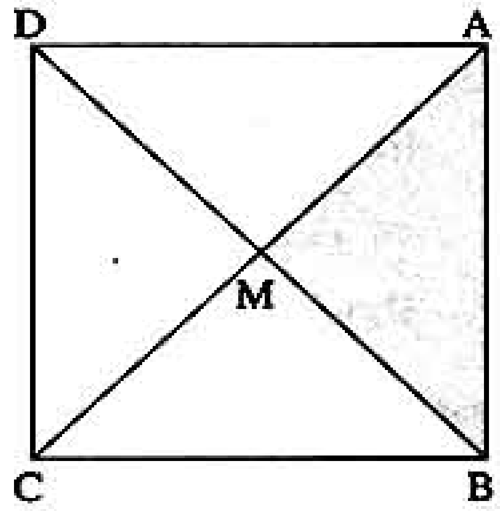
7 📖 **In the opposite figure :**

ABCD is a square whose side length is 4 cm.

M is the point of intersection of its diagonals. Draw :

(1) The image of Δ MAB by the translation of distance 2 cm. in the direction of $\overrightarrow{AD}$

(2) The image of Δ AMB by the translation AM in the direction of $\overrightarrow{AM}$



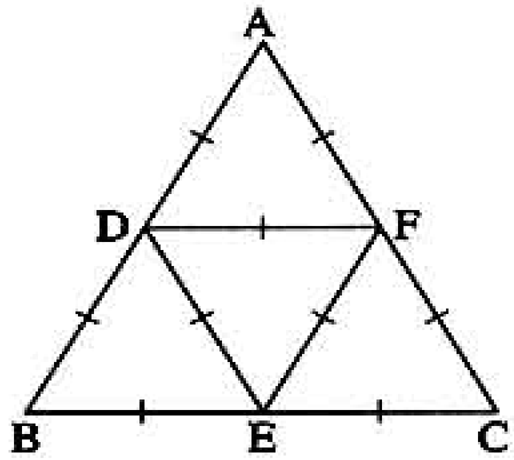
8 📖 **In the opposite figure :**

The triangles ADF , BDE , DEF and EFC are congruent.

Complete :

(1) The image of Δ ADF by a translation of magnitude of AD in the direction of $\overrightarrow{AD}$ is ....

(2) Δ FEC is the image of Δ DBE by a translation of magnitude .... in the direction of ....



9 **In the opposite figure :**

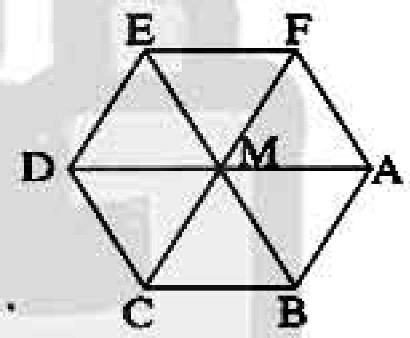
ABCDEF is a regular hexagon. **Complete the following :**

(1) The image of the point D by translation DM in the direction of $\overrightarrow{DM}$ is ....

(2) The image of $\overline{AF}$ by translation ED in the direction of $\overrightarrow{ED}$ is ....

(3) The image of Δ MCD by translation EF in the direction of $\overrightarrow{EF}$ is ....

(4) The translation which makes Δ DME the image of Δ MAF is ....



10 📖 **In the opposite figure :**

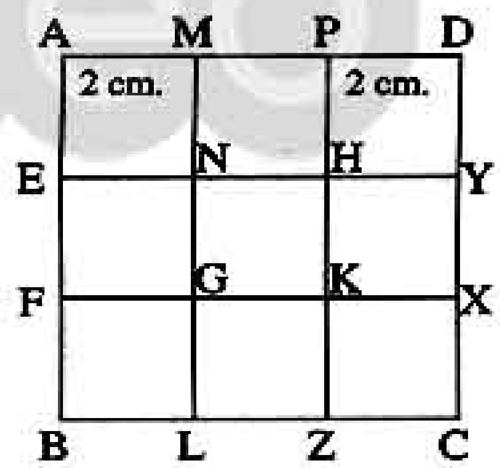
ABCD is a square and all the interior squares are congruent.

Complete :

(1) The image of $\overline{AE}$ by a translation of magnitude of 2 cm. in the direction of $\overrightarrow{GK}$ is ....

(2) The image of the square AENM by a translation of magnitude of 4 cm. in the direction of $\overrightarrow{PK}$ is ....

(3) The square MNHP is the image of the square GLZK by a translation of magnitude .... in the direction of ....



11 📖 Δ ABC is right-angled at B where AB = 3 cm. and BC = 4 cm. If Δ $\grave{A}\grave{B}\grave{C}$ is the image of Δ ABC by translation of a distance 3 cm. in the direction of $\overrightarrow{CB}$

Prove that : The figure $A\grave{A}\grave{C}C$ is a parallelogram.

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12 Draw Δ ABC which is right-angled at B , in which AB = BC = 3 cm.
then find the image of Δ ABC by translation of a distance 3 cm. in the direction of $\overrightarrow{AB}$, then
Prove that : The figure BB̀C̀C is a square.

13 ABCD is a rectangle , where E $\in \overline{AD}$ Find the translated image of Δ ABE by translation of a magnitude DA in the direction of $\overrightarrow{AD}$ If È is the image of E by the same translation.
Prove that : The figure BCÈE is a parallelogram.

14 ABCD is a parallelogram , $\overline{BE} \perp \overline{AD}$ cutting it at E Find Δ ÀB̀D as the image of Δ ABE by translation of a distance ED in the direction of $\overrightarrow{AD}$, then prove that the figure EBB̀D is a rectangle.

Second | Problems on translation in the Cartesian plane :

1 **Complete the following :**

(1) The image of the point (2 , 5) by translation $(x , y) \longrightarrow (x + 2 , y + 1)$ is ....
(2) The image of the point (3 , 2) by translation $(x , y) \longrightarrow (x + 3 , y - 2)$ is ....
(3) The image of the point (– 5 , 4) by translation $(x , y) \longrightarrow (x + 4 , y - 5)$ is ....
(4) The image of the point (– 2 , – 5) by translation $(x , y) \longrightarrow (x - 2 , y)$ is ....
(5) The image of the point (3 , – 2) by translation $(x , y) \longrightarrow (x , y + 3)$ is ....

2 **Choose the correct answer from those given :**

(1) The image of the point (– 1 , 2) by translation of magnitude of 3 units in the positive direction of the x-axis is ....
(a) (– 1 , 5) (b) (2 , 2) (c) (– 2 , 2) (d) (– 1 , 3)

(2) The image of the point (– 3 , 4) by translation of magnitude of 4 units in the negative direction of the y-axis is ....
(a) (– 3 , 0) (b) (– 7 , 4) (c) (– 3 , 8) (d) (– 1 , 4)

(3) If À (3 , – 3) is the image of A by translation $(x , y) \longrightarrow (x - 1 , y - 4)$, then the point A is ....
(a) (2 , – 7) (b) (4 , 1) (c) (– 4 , – 1) (d) (2 , 1)

(4) The image of the point (– 1 , 4) by the translation (3 , – 2) followed by reflection in the x-axis is ....
(a) (2 , 2) (b) (– 2 , 2) (c) (– 2 , – 2) (d) (2 , – 2)

(5) If the point (a , – 1) is the image of (2 , 4) by the translation $(x , y) \longrightarrow (x + 1 , y - b)$, then (a , b) is ....
(a) (3 , 3) (b) (1 , 3) (c) (3 , 5) (d) (1 , – 5)

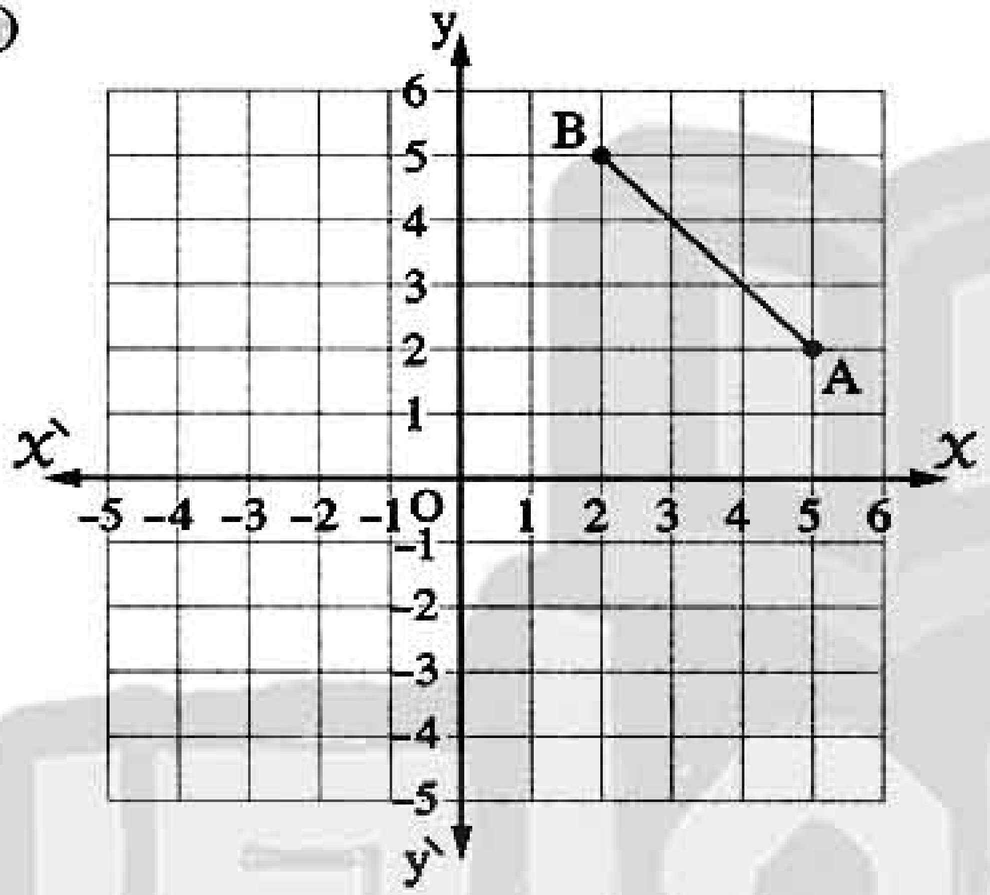
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(6) If : $\acute{A}$ is the image of the point A (2 , 3) by reflection in the y-axis , then A is the image of $\acute{A}$ by the translation ....

(a) $(x , y) \longrightarrow (x + 4 , y)$
(b) $(x , y) \longrightarrow (x , y + 6)$
(c) $(x , y) \longrightarrow (x - 4 , y)$
(d) $(x , y) \longrightarrow (x , y - 6)$

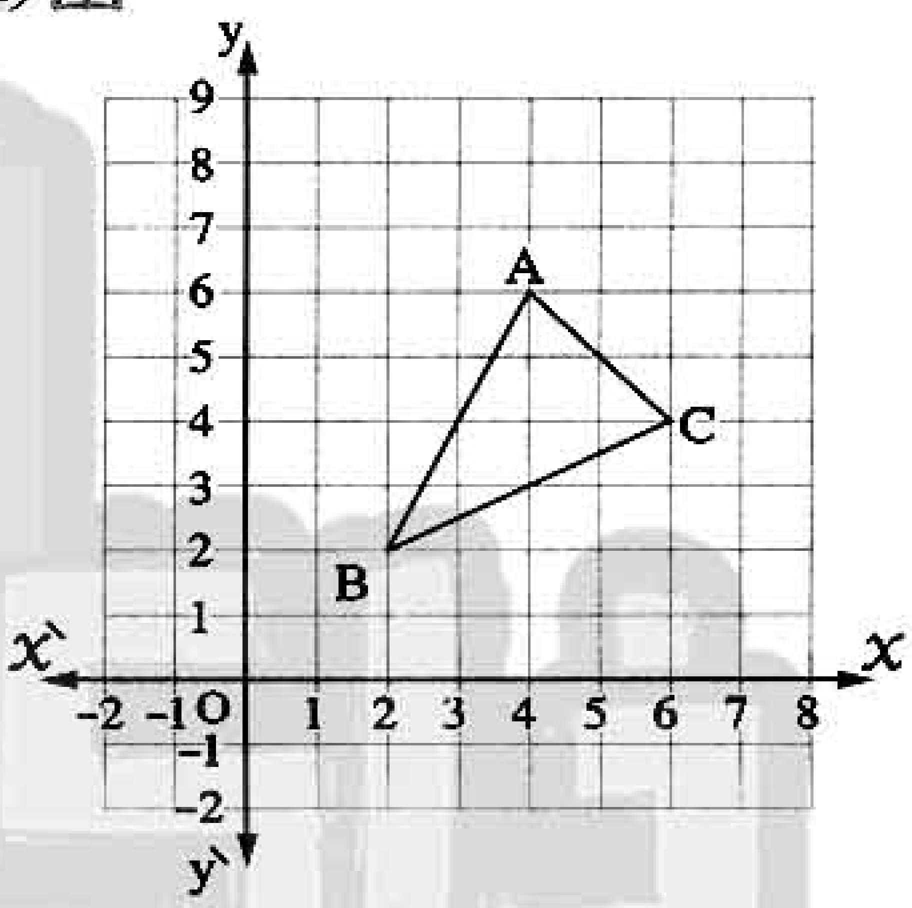
3 **Find the image of each of the following figures by the translation shown under each figure :**

(1)



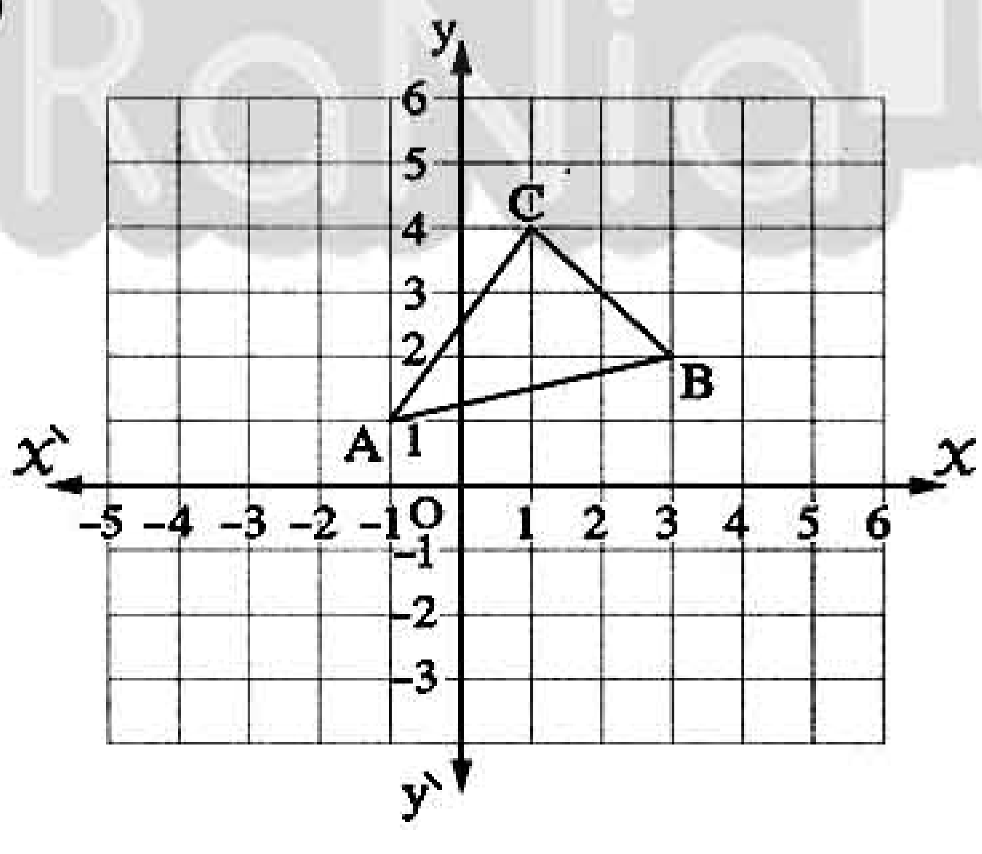
$(x , y) \longrightarrow (x - 3 , y - 4)$

(2)



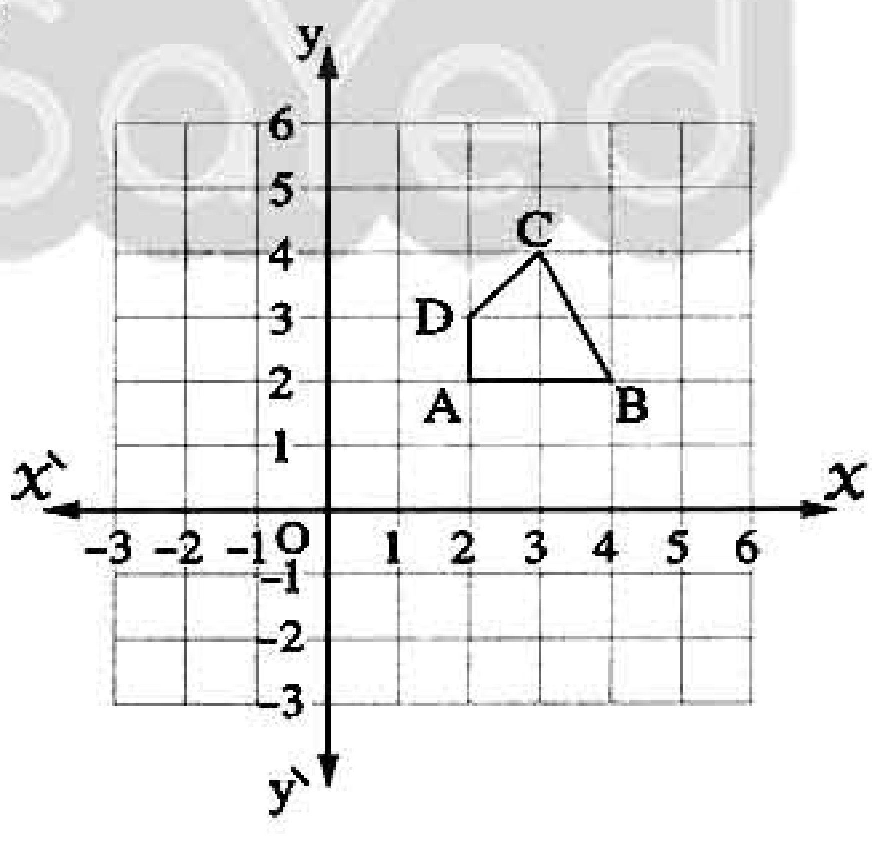
$(x , y) \longrightarrow (x + 2 , y + 3)$

(3)



$(x , y) \longrightarrow (x + 2 , y)$

(4)



$(x , y) \longrightarrow (x + 3 , y - 2)$

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10 On a square lattice, draw Δ ABC where A (2 , 1), B (1 , – 1) and C (0 , 1), then draw its image by a translation of 2 AB in the direction of $\overrightarrow{AB}$

11 📖 A square has vertices A (1 , 1), B (4 , 2), C (3 , 5) and D (0 , 4)

(1) Graph the square and its image under the translation which maps vertex A onto vertex B

(2) Write the mapping rule for the translation.

12 📖 Use the translation : $(x , y) \longrightarrow (x + 2 , y + 3)$ to locate the point whose image is (2 , 3)

13 📖 If the image of the point A (1 , 1) by translation in the plane is À (2 , 2), find the images of the points O (0 , 0), B (– 1 , 3) and C (– 3 , 5) by the same translation.

14 If A (– 3 , 1) and B (1 , – 2), write the mapping rule of the translation that makes B the image of A

15 If A (3 , 2), B (5 , 1), find :

(1) C̀ which is the image of C (1 , – 1) under translation of AB in the direction of $\overrightarrow{AB}$

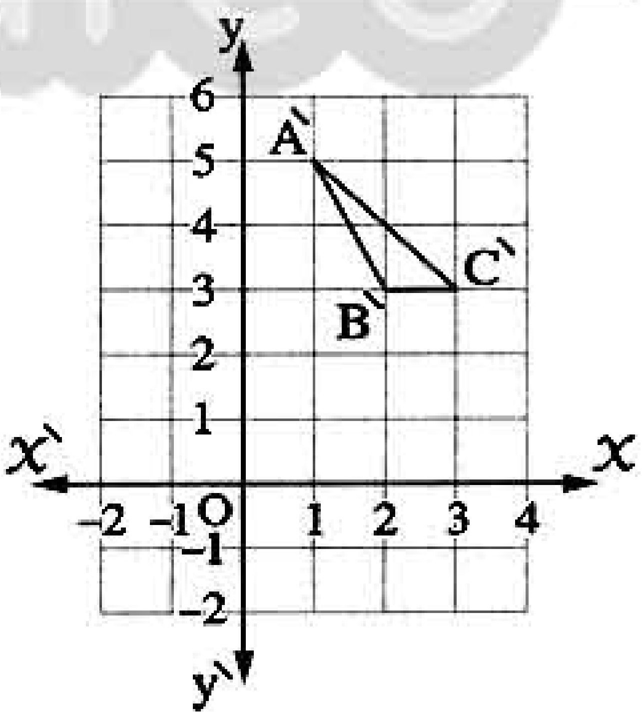
(2) D whose image is D̀ (2 , 1) under translation of AB in the direction of $\overrightarrow{AB}$

16 📖 The point À (3 , – 3) is the image of the point A by the translation $(x , y) \longrightarrow (x - 1 , y - 4)$ Locate A then by the same translation, draw the image of Δ ABC where B (5 , 0) and C (– 1 , – 2)

17 📖 **In the opposite figure :**

Copy the graph, then draw the triangle ABC whose image is Δ ÀB̀C̀ by the translation

$(x , y) \longrightarrow (x + 2 , y + 3)$



18 If A (– 2 , 1) and B (1 , 3), find on a square lattice the image of $\overline{AB}$ by reflection in x-axis followed by the translation $(x , y) \longrightarrow (x + 4 , y)$

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19 State whether the graph shows a reflection or a translation :

(1) Name the line of reflection.

(2) Describe the translation.

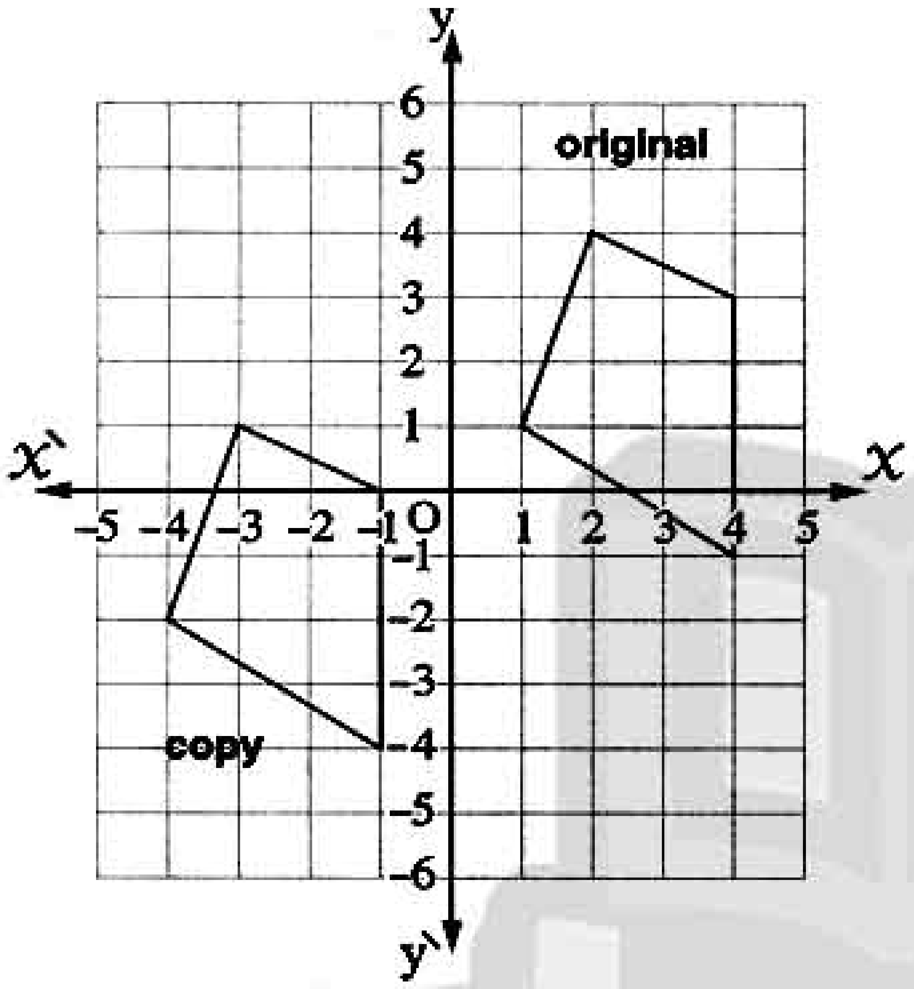


fig. (1)

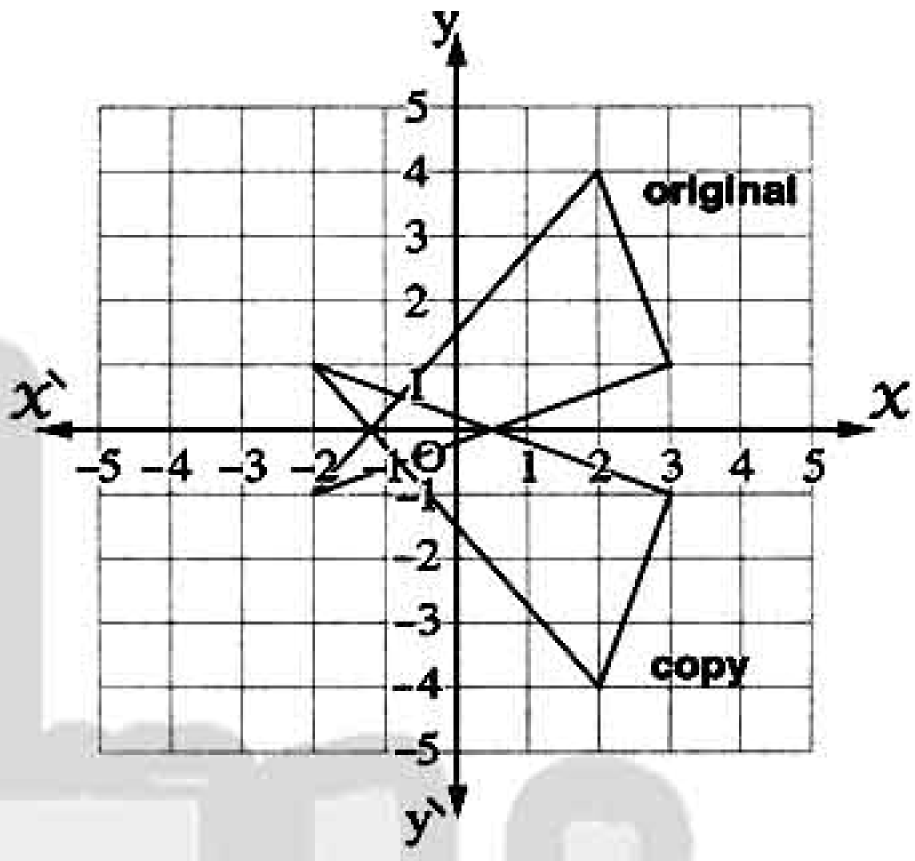


fig. (2)

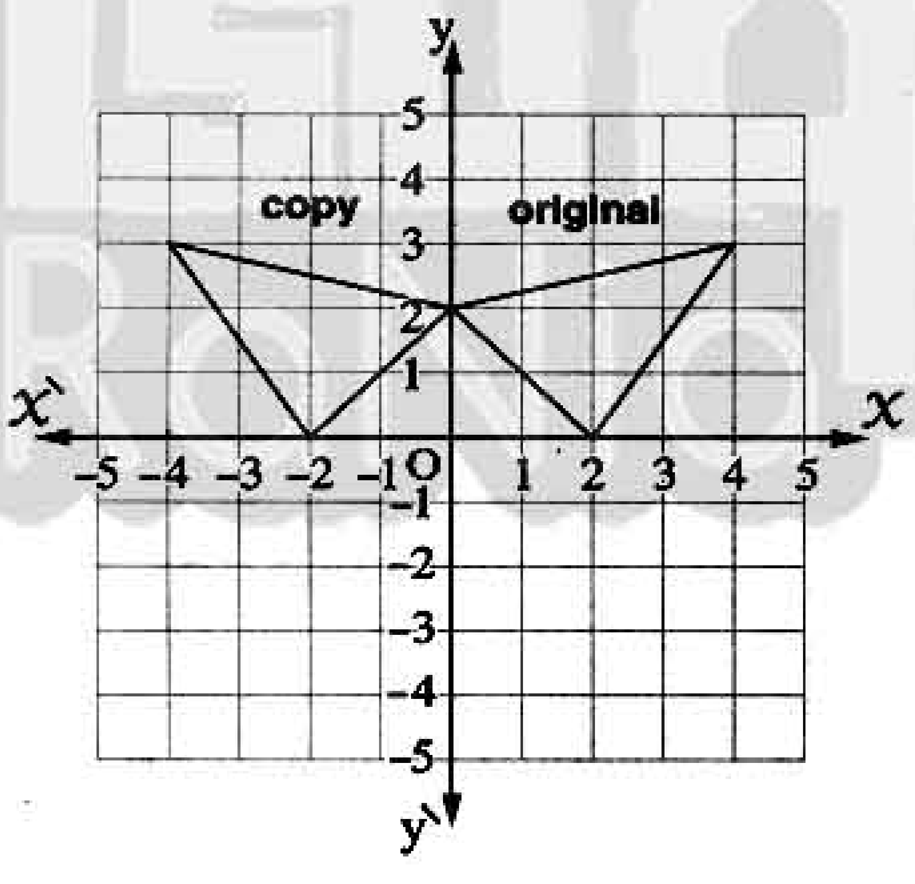


fig. (3)

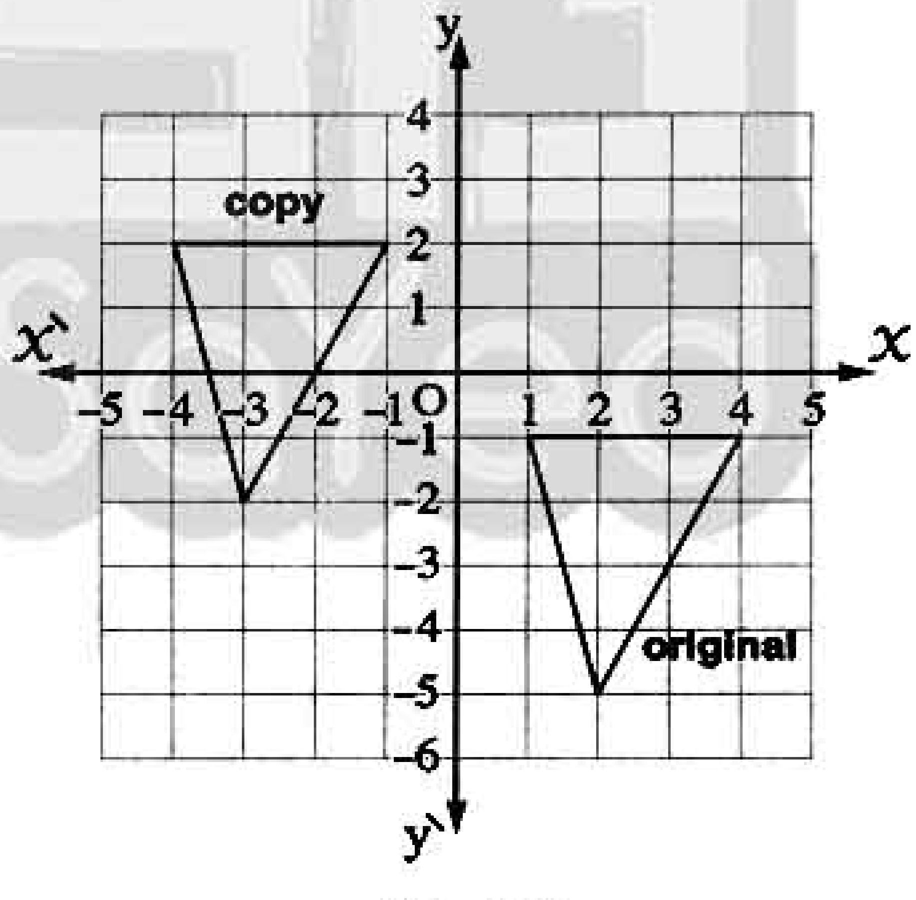


fig. (4)

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Worksheet 5 till lesson 5 unit 3

Answer the following questions :

1 Choose the correct answer from those given :

(1) The sum of measures of the interior angles of the triangle = ...
(a) 108° (b) 180° (c) 630° (d) 360°

(2) If the measures of two angles in a triangle are 40° and 45° , then the triangle is ....
(a) acute-angled (b) right-angled (c) obtuse-angled (d) equilateral

(3) In the parallelogram ABCD , if ∠ A is acute , then ∠ C is ....
(a) acute. (b) obtuse.
(c) right. (d) reflex.

(4) The parallelogram in which one of its angles is right is ....
(a) a trapezium. (b) a square. (c) a rhombus. (d) a rectangle.

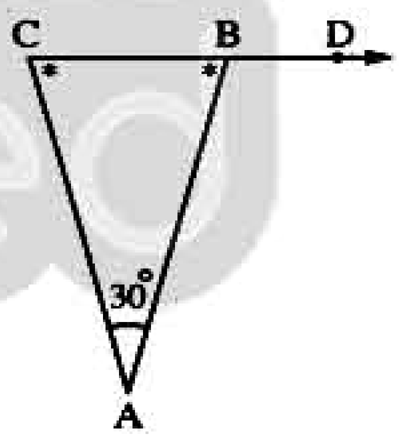
(5) The measure of the exterior angle of the equilateral triangle = ...
(a) 30° (b) 60° (c) 90° (d) 120°

(6) The number of sides of the regular polygon in which the measure of an interior angle = 120° is ....
(a) 5 (b) 6 (c) 7 (d) 8

2 Complete the following :

(1) The measure of the exterior angle of the triangle equals ....

(2) **In the opposite figure :**
$D \in \overrightarrow{CB}$, m (∠ A) = 30° ,
then m (∠ ABD) = ... °

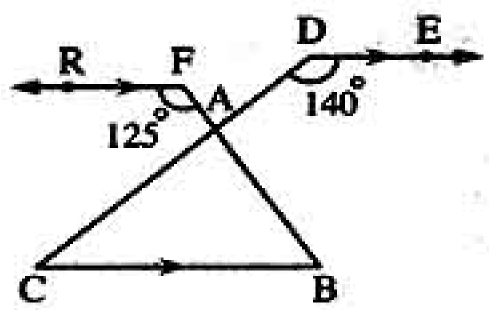


(3) In the parallelogram ABCD ,
if m (∠ A) = $\frac{1}{2}$ m (∠ B) , then m (∠ B) = ...

(4) The two diagonals of the rhombus are .... and ....

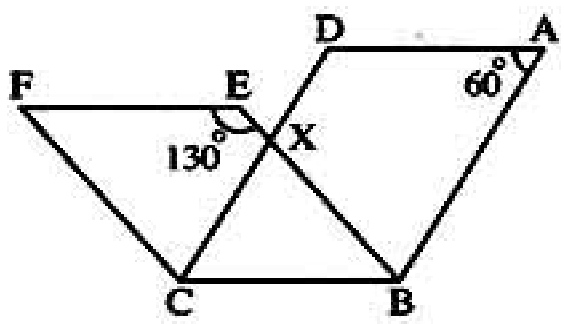
3 In the opposite figure :

$\overrightarrow{DE}$ // $\overrightarrow{FR}$ // $\overline{BC}$
m (∠ D) = 140° , m (∠ F) = 125°
Calculate the measures of the angles of Δ ABC



4 In the opposite figure :

ABCD and EBCF are two parallelograms , m (∠ A) = 60°
m (∠ E) = 130°
Find : by proof m (∠ BXC)



ذاكرولي
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The answer of worksheet 5

Total mark 15

1 Shade the circle that represents your choice for the correct answer :

(1) ⓐ ⓑ ⓒ ⓓ

(2) ⓐ ⓑ ⓒ ⓓ

(3) ⓐ ⓑ ⓒ ⓓ

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RaNia SaYed

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Worksheet 6 till lesson 6 unit 3

Answer the following questions :

1 Choose the correct answer from those given :

(1) The sum of measures of the interior angles of the heptagon = ...
(a) 540° (b) 720° (c) 900° (d) 180°

(2) The side length of a rhombus is 5 cm. , then its perimeter = ... cm.
(a) 10 (b) 15 (c) 20 (d) 25

(3) The concave polygon should has a .... angle.
(a) acute (b) right (c) obtuse (d) reflex

(4) ABCD is a parallelogram in which m (∠ A) + m (∠ C) = 160° , then m (∠ B) = ...
(a) 20° (b) 80° (c) 100° (d) 110°

(5) The sum of measures of the interior angles of the triangle = the measure of .... angle.
(a) a right. (b) a straight. (c) acute. (d) reflex.

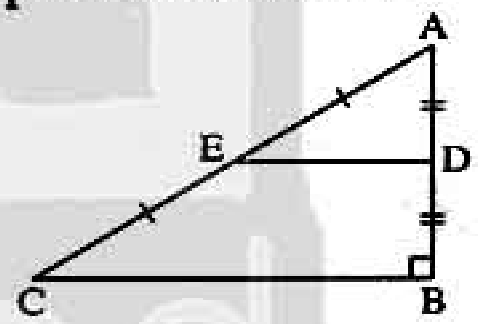
(6) The length of the line segment joining the midpoints of two sides of a triangle equals .... the length of the third side.
(a) $\frac{1}{4}$ (b) twice (c) $\frac{1}{2}$ (d) $\frac{1}{3}$

2 Complete the following :

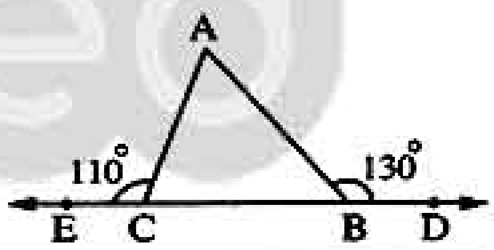
(1) The measure of each interior angle in a regular polygon of n sides = ...

(2) The ray which is drawn from the midpoint of a side of a triangle parallel to one of the other sides ....

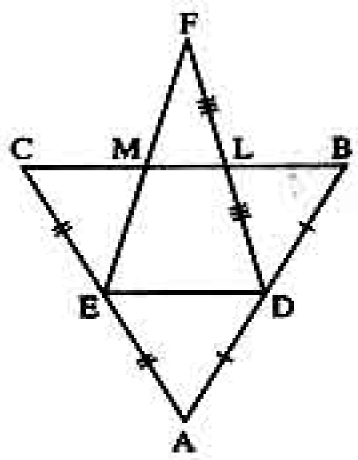
(3) **In the opposite figure :**
If m (∠ B) = 90° , D and E are the midpoints of $\overline{AB}$ and $\overline{AC}$ respectively then m (∠ ADE) = ... °



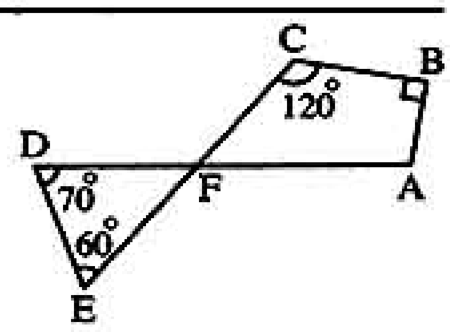
(4) **In the opposite figure :**
If D ∈ $\overrightarrow{CB}$ and E ∈ $\overrightarrow{BC}$,
then m (∠ A) = ... °



3 In the opposite figure :
D is the midpoint of $\overline{AB}$,
E is the midpoint of $\overline{AC}$,
L is the midpoint of $\overline{FD}$
BC = 20 cm.
Find : the length of $\overline{LM}$



4 In the opposite figure :
$\overline{AD} \cap \overline{CE}$ = {F} , m (∠ B) = 90°
m (∠ C) = 120° , m (∠ E) = 60° , m (∠ D) = 70°
Find : m (∠ A)



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The answer of worksheet 6

Total mark 15

1 Shade the circle that represents your choice for the correct answer :

(1) (a) (b) (c) (d)

(2) (a) (b) (c) (d)

(3) (a) (b) (c) (d)

(4) (a) (b) (c) (d)

(5) (a) (b) (c) (d)

(6) (a) (b) (c) (d)

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Worksheet 7 till lesson 7 unit 3

Answer the following questions :

1 Choose the correct answer from those given :

(1) The measure of the interior angle of a regular hexagon = ...

(a) 120°　(b) 102°　(c) 180°　(d) 360°

(2) In Δ ABC , if m (∠ A) = m (∠ B) = 50° , then m (∠ C) = ...

(a) 130°　(b) 100°　(c) 80°　(d) 50°

(3) The parallelogram whose one of its angles is aright angle is called ....

(a) trapezium.　(b) square.　(c) rhombus.　(d) rectangle.

(4) A rectangle whose length = 4 cm. and width = 3 cm. , then the length of its diagonal = ... cm.

(a) 3　(b) 4　(c) 5　(d) 25

(5) The number of sides of the regular polygon which the measure of one of its interior angles is 144° = ...

(a) 4 sides.　(b) 6 sides.　(c) 8 sides.　(d) 10 sides.

(6) In Δ ABC , if m (∠ B) = m (∠ A) + m (∠ C) , then ∠ B is ....

(a) acute.　(b) right.　(c) obtuse.　(d) reflex.

2 Complete the following :

(1) In the right-angled triangle , the area of the square on the hypotenuse equals ....

(2) The square is .... with a right angle.

(3) The line segment joining the midpoints of two sides of a triangle is .... the third side and its length equals ....

(4) If ABCD is a parallelogram in which m (∠ A) = 40° , then m (∠ B) = ...°

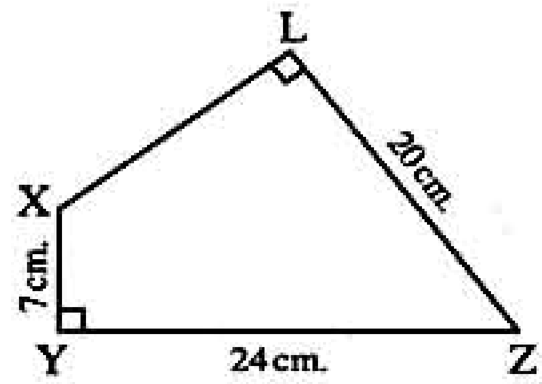
3 In the opposite figure :

m (∠ Y) = m (∠ L) = 90°

, XY = 7 cm. , YZ = 24 cm.

and L Z = 20 cm.

Find : the length of $\overline{XL}$



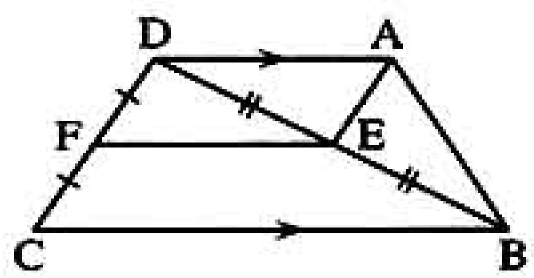
4 In the opposite figure :

$\overline{AD}$ // $\overline{BC}$, AD = $\frac{1}{2}$ BC

, E is the midpoint of $\overline{BD}$

and F is the midpoint of $\overline{CD}$

Prove that : AEFD is a parallelogram.



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The answer of worksheet 7

Total mark 15

1 Shade the circle that represents your choice for the correct answer :

(1) (a) (b) (c) (d)

(2) (a) (b) (c) (d)

(3) (a) (b) (c) (d)

(4) (a) (b) (c) (d)

(5) (a) (b) (c) (d)

(6) (a) (b) (c) (d)

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Worksheet 8 till lesson 8 unit 3

Answer the following questions :

1 Choose the correct answer from those given :

(1) The sum of measures of the interior angles of the hexagon = ...

(a) 4 right angles. (b) 5 right angles. (c) 6 right angles. (d) 8 right angles.

(2) If ABCD is a square , then $(AC)^2$ = ...

(a) AB (b) $(AB)^2$ (c) $2\,(AB)^2$ (d) $4\,(AB)^2$

(3) In Δ ABC , if $m(\angle B) = \frac{1}{2}\, m(\angle A) = 30°$, then the triangle will be .... triangle.

(a) acute-angled (b) right-angled (c) equilateral (d) isosceles

(4) The image of the point (1 , 2) by the transformation $(x , y) \longrightarrow (x , -y)$ is ....

(a) (– 1 , 2) (b) (– 1 , – 2) (c) (1 , – 2) (d) (2 , – 1)

(5) The sum of measures of the exterior angles of a polygon of n sides equals ....

(a) 180° (b) 360° (c) (n – 2) × 180° (d) $\frac{(n-2) \times 180}{n}$

(6) In Δ ABC , if D and E are the midpoints of $\overline{AB}$ and $\overline{AC}$ respectively and BC = 8 cm. , then DE = ... cm.

(a) 16 (b) 12 (c) 4 (d) 2

2 Complete the following :

(1) If two straight lines intersect , then each two vertically opposite angles are ....

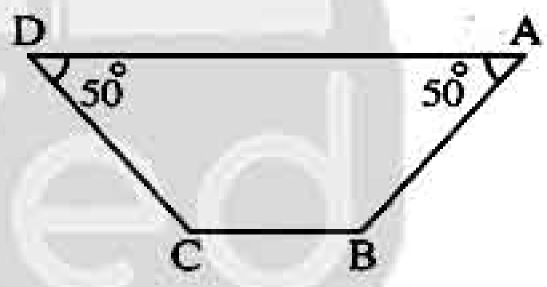
(2) If Δ XYZ is a right - angled triangle at Z , then $(XZ)^2$ = ...

(3) **In the opposite figure :**

$m(\angle A) = m(\angle D) = 50°$

$\overrightarrow{AB}$ and $\overrightarrow{DC}$ intersect at E not shown in the figure.

, then $m(\angle E)$ = ...



(4) The quadrilateral in which two opposite sides are parallel is ....

3 [a] If the ratio among the measures of the interior angles of a quadrilateral is 2 : 2 : 3 : 5 , find the measure of the greatest angle in the quadrilateral.

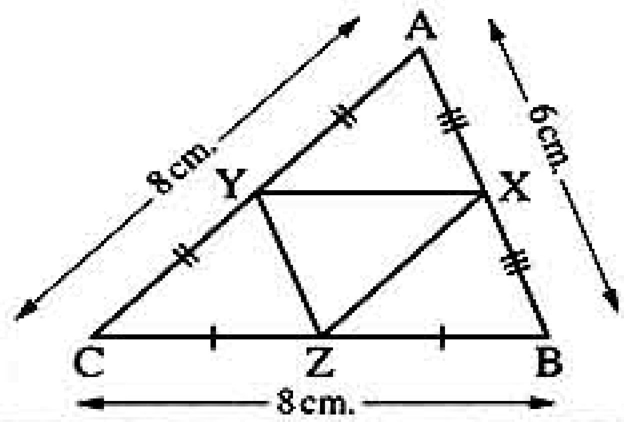
[b] In the opposite figure :

ABC is a triangle in which X , Y and Z are the midpoints of $\overline{AB}$, $\overline{AC}$ and $\overline{BC}$ respectively

It AB = 6 cm. , BC = 8 cm. , AC = 8 cm. ,

(1) calculate the perimeter of Δ XYZ

(2) determine the type of the figure XYCZ



4 On lattice , draw Δ ABC where A (1 , 2) , B (4 , 2) , C (4 , 4) , then map its image by the transformation $(x , y) \longrightarrow (y , -x)$

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The answer of worksheet 8

Total mark 15

1 **Shade the circle that represents your choice for the correct answer :**

(1) (a) (b) (c) (d)

(2) (a) (b) (c) (d)

(3) (a) (b) (c) (d)

(4) (a) (b) (c) (d)

(5) (a) (b) (c) (d)

(6) (a) (b) (c) (d)

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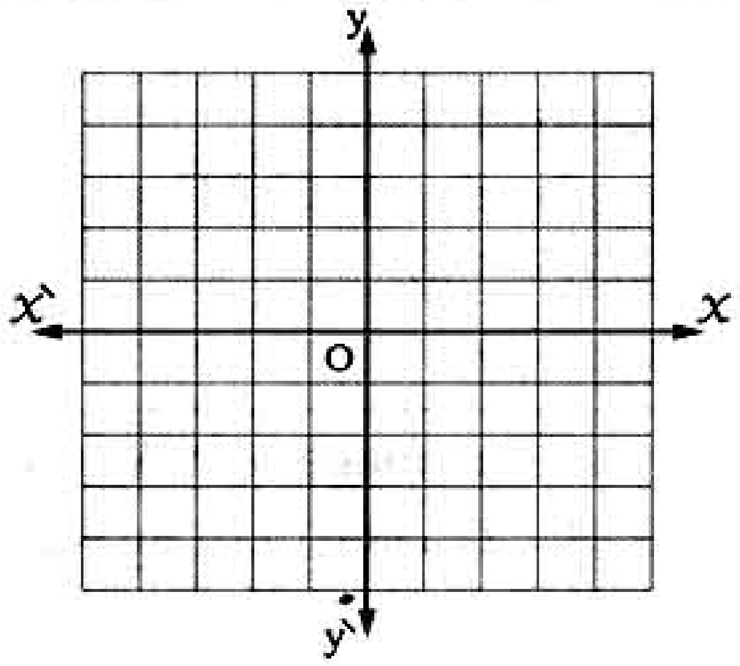
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Worksheet 9 till lesson 9 unit 3

Answer the following questions :

1 Choose the correct answer from those given :

(1) The number of axes of symmetry of the square is ....

(a) 1 (b) 2 (c) 3 (d) 4

(2) The image of the point (3 , – 5) by the reflection in x-axis is ....

(a) (3 , 5) (b) (– 3 , 5) (c) (– 3 , – 5) (d) (3 , – 5)

(3) ABC is a triangle in which m (∠ A) = 60° , m (∠ B) = 2 m (∠ C) , then m (∠ B) = ...

(a) 40° (b) 60° (c) 70° (d) 80°

(4) The image of the point (2 , 3) by the reflection in y-axis is ....

(a) (– 2 , 3) (b) (2 , – 3) (c) (– 2 , – 3) (d) (3 , 2)

(5) The sum of measures of the exterior angles of the octagon = ...

(a) 540° (b) 360° (c) 720° (d) 1080°

(6) ABC is a right - angled triangle at B in which AB = 3 cm. and BC = 4 cm. , then AC = ... cm.

(a) 2.5 (b) 5 (c) 16 (d) 9

2 Complete the following :

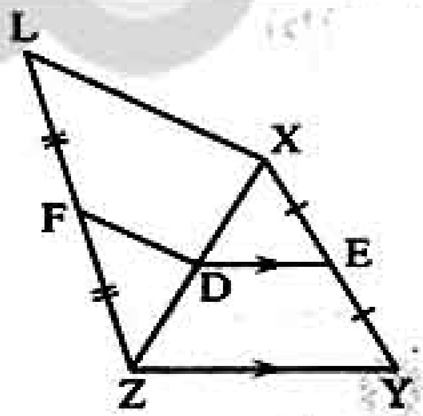
(1) The measure of the exterior angle of the triangle equals ....

(2) The image of the point (– 5 , 4) by the transformation $(x , y) \longrightarrow (-y , x)$ is ....

(3) If ABCD is a rhombus , then .... ⊥ ....

(4) The reflection in a straight line keeps .... , ... , ... , ...

3 [a] In the opposite figure :

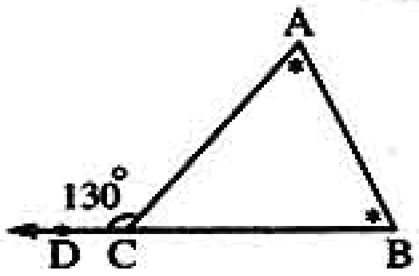


XE = EY , $\overline{ED}$ // $\overline{YZ}$

F is the midpoint of $\overline{ZL}$

Prove that : $\overline{DF}$ // $\overline{XL}$

[b] In the opposite figure :



ABC is a triangle , D ∈ $\overrightarrow{BC}$

m (∠ ACD) = 130°

Find : m (∠ B)

4 On lattice , find the image of Δ ABO where

A (2 , 2) , B (4 , 2) , O (0 , 0) by reflection in y-axis.

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The answer of worksheet 9

Total mark 15

1 **Shade the circle that represents your choice for the correct answer :**

(1)	(a)	(b)	(c)	(d)
(2)	(a)	(b)	(c)	(d)
(3)	(a)	(b)	(c)	(d)
(4)	(a)	(b)	(c)	(d)
(5)	(a)	(b)	(c)	(d)
(6)	(a)	(b)	(c)	(d)

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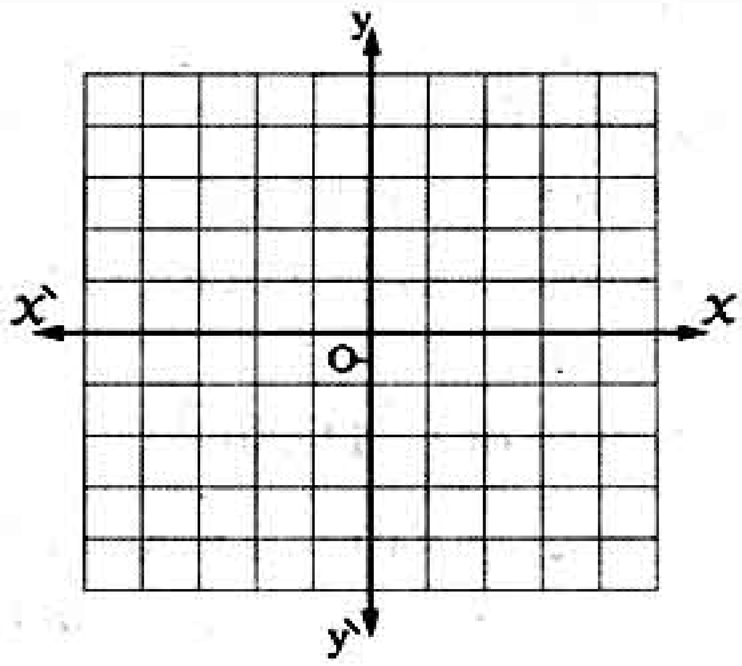
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Worksheet 10 till lesson 10 unit 3

Answer the following questions :

1 Choose the correct answer from those given :

(1) The point (2 , – 4) is the image of the point .... by reflection in the origin point.
(a) (2 , 4) (b) (– 2 , 4) (c) (– 2 , – 4) (d) (2 , – 4)

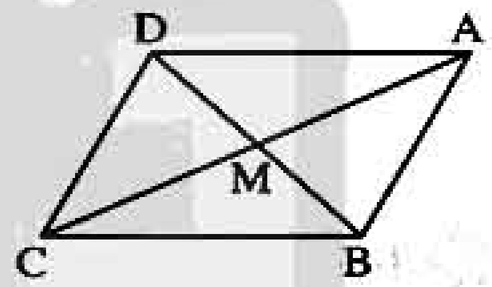
(2) The measure of the exterior angle of a triangle is .... the measure of any interior angle of the triangle except its adjacent angle.
(a) > (b) < (c) = (d) ≤

(3) If ABCD is a rectangle , then AC = ...
(a) AB (b) BC (c) BD (d) CD

(4) The parallelogram whose two diagonals are perpendicular and the measure of one of its angles is 90° is called ....
(a) rectangle. (b) rhombus. (c) square. (d) trapezium.

(5) The number of axes of symmetry of the rectangle is ....
(a) 1 (b) 2 (c) 3 (d) 4

(6) **In The opposite figure :**
If ABCD is a parallelogram , then the image of Δ AMD by reflection in the point M is Δ ....
(a) AMB (b) DMC
(c) CMB (d) DMA



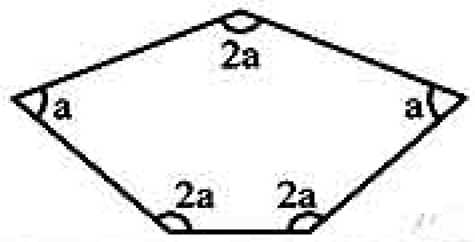
2 Complete the following :

(1) If the reflection in a straight line transforms the figure to itself , then this straight line is called ....

(2) The sum of the measures of the accumulative angles at a point is ....

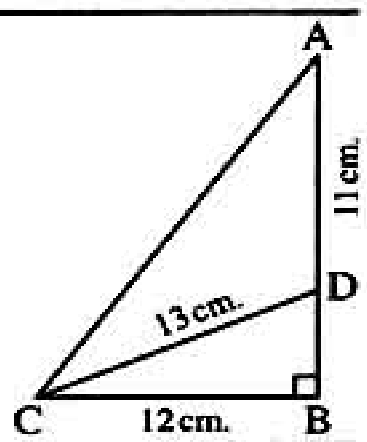
(3) The ray drawn from the midpoint of a side of a triangle parallel to another side .... the third side.

(4) **In the opposite figure :**
The value of a = ...



3 In the opposite figure :

ABC is a triangle in which m (∠ B) = 90°
, D ∈ $\overline{AB}$, where AD = 11 cm. , BC = 12 cm.
and DC = 13 cm.
Find the length of : $\overline{BD}$ and $\overline{AC}$



4 Draw on a lattice Δ ABC , where A (5 , 1) , B (2 , 1) and C (5 , 3) , then draw its image by reflection in the origin point.

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The answer of worksheet 10

Total mark: 15

1 Shade the circle that represents your choice for the correct answer :

(1) (a) (b) (c) (d)
(2) (a) (b) (c) (d)
(3) (a) (b) (c) (d)
(4) (a) (b) (c) (d)
(5) (a) (b) (c) (d)
(6) (a) (b) (c) (d)

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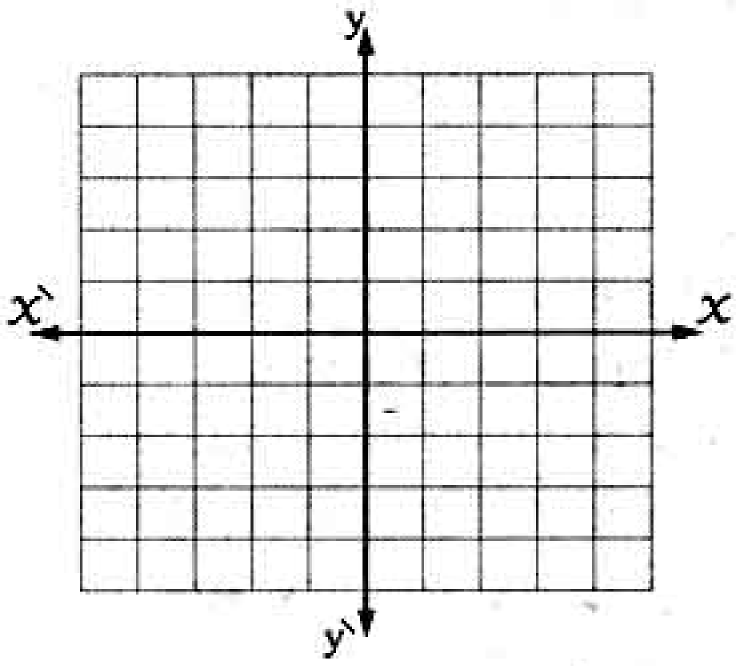
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RaNia SaYed

هذا العمل خاص بموقع ذاكرولى التعليمى ولا يسمح بتداوله على مواقع أخرى



Worksheet 11 till lesson 11 unit 3

Answer the following questions :

1 Choose the correct answer from those given :

(1) ABC is a triangle in which m (∠ A) = 4 x° , m (∠ B) = 2 x° and m (∠ C) = 3 x° , then ∠ A is ....

(a) acute. (b) right. (c) obtuse. (d) reflex.

(2) The quadrilateral in which each two opposite sides are equal in length is ....

(a) a parallelogram. (b) a trapezium. (c) a square. (d) a rectangle.

(3) The image of the point (– 2 , 3) by a translation of magnitude 5 units in the positive direction of the x-axis is ....

(a) (– 2 , – 2) (b) (– 7 , 3) (c) (– 2 , 8) (d) (3 , 3)

(4) The image of the point (0 , 5) by reflection in the x-axis is ....

(a) (0 , 5) (b) (0 , – 5) (c) (5 , 0) (d) (– 5 , 0)

(5) The image of the point (x , – y) by reflection in the origin point is ....

(a) (x , y) (b) (– x , y) (c) (x , – y) (d) (– x , – y)

(6) If A' (3 , 5) is the image of the point A by the translation (x , y) ⟶ (x + 4 , y – 2) , then the point A is ....

(a) (7 , 3) (b) (7 , 7) (c) (– 1 , 7) (d) (– 1 , 3)

2 Complete the following :

(1) If the measure of an exterior angle of a regular polygon = 30° , then the number of sides of the polygon = ...

(2) The line segment which joins the two midpoints of the two sides of a triangle .... and ....

(3) The translation keeps .... , ...

(4) The translation is determined by two things , they are .... and ....

3 On lattice , draw Δ ABC where A (– 3 , 2) , B (– 1 , 1) and C (– 2 , 4) then draw its image.

(1) by the translation (x , y) ⟶ (x + 4 , y – 3)

(2) by reflection in x-axis.

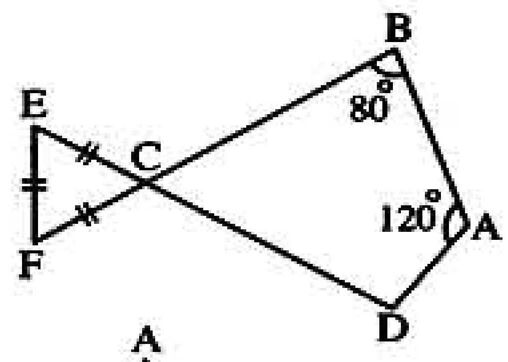
4 [a] In the opposite figure :

ABCD is a quadrilateral in which

m (∠ A) = 120° , m (∠ B) = 80°

Δ CEF is an equilateral

Find by proof : m (∠ D)

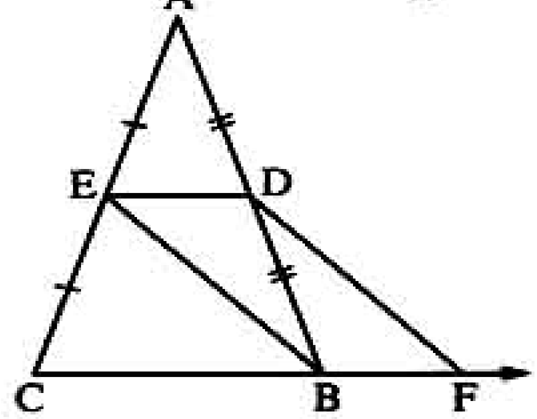


[b] In the opposite figure :

D and E are the two midpoints of $\overline{AB}$ and $\overline{AC}$ respectively ,

F ∈ $\overrightarrow{CB}$ where BF = $\frac{1}{2}$ BC

Prove that : the figure BEDF is a parallelogram.



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The answer of worksheet 11

Total mark 15

1 **Shade the circle that represents your choice for the correct answer :**

(1) ⓐ ⓑ ⓒ ⓓ

(2) ⓐ ⓑ ⓒ ⓓ

(3) ⓐ ⓑ ⓒ ⓓ

(4) ⓐ ⓑ ⓒ ⓓ

(5) ⓐ ⓑ ⓒ ⓓ

(6) ⓐ ⓑ ⓒ ⓓ

3

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2 (1) ....

(2) ....

(3) ....

(4) ....

2

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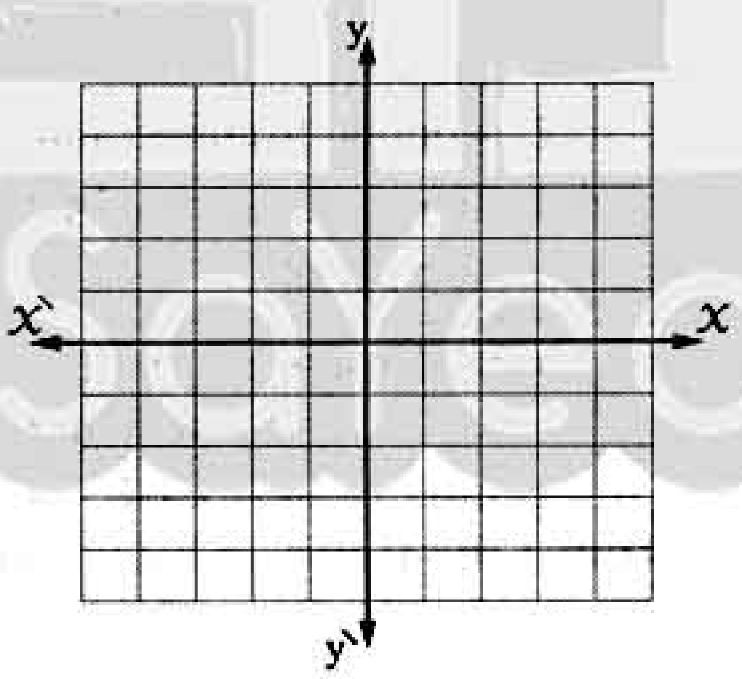
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4 [a] ....

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[b] ....

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RaNia Sayed

هذا العمل خاص بموقع ذاكرولى التعليمى ولا يسمح بتداوله على مواقع أخرى

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